Developing of Pedagogical Competence of Elementary School Teachers in West Bandung Regency

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Abstract

This article aims to describe the pedagogical competence of elementary school teachers in West Bandung Regency in the era of the industrial revolution 4.0. Data was obtained through a community service program that included elementary school teachers in West Bandung Regency. The program went well, and the teacher expressed his understanding of the pedagogical competence of teachers in the era of the industrial revolution 4.0, however, the observations on implementation indicated 1) the use of digital technology that educates in learning has not been widely applied; 2) understanding the characteristics of students and effective learning in the era of the industrial revolution 4.0 is not yet fully mastered by teachers, and 3) teacher enthusiasm in community service activities. In this regard, it is essential to study more deeply about teachers as lifelong learners who have high enthusiasm in developing themselves. The teacher also needs to understand the characteristics of students, so they can educate them appropriately. Furthermore, it is also necessary to understand that education is a system in which all components are integrated for the operation of the system. For the creation of a good education, all factors in education need to be considered.

Keywords: Pedagogical Competence, Industrial Revolution 4.0, Community Service
Introduction

Mentioned in Law of the Republic of Indonesia Number 20 of 2003 concerning National Education System Chapter I Article 1 Paragraph 3 (Law of the Republic of Indonesia Number 20 of 2003 concerning National Education System), "National education system is the whole component of education which is interrelated in an integrated manner to achieve national education goals." Based on this statement, education is a system that has intertwined components. The components in the education system are educational goals, students, educators (Brizenka, 1992, p. 43; Rasyidin, 2014, p. 86; Sadulloh, 2010, p. 84), educational content (Rasyidin, 2014, p. 86), and educational tools (Rasyidin, 2014, p. 86; Sadulloh, 2010, p. 84).

Educators are one component of the system in education. Educators are adults (Rasyidin, 2014, p. 107; Sadulloh, 2015, p. 128) in educational situations with students, not in social situations, natural surroundings or in general society (Rasyidin, 2014, p. 107; Syaripudin & Kurniasih, 2010, p. 68). As with other components in the education system, educators are essential for the quality of the education system. In schooling, educators, namely teachers, who provide education to educands, in this context, we refer to as students. Teachers should have the competencies needed to be able to educate students well. Mentioned in Law of the Republic of Indonesia Number 14 the Year 2005 Regarding Teachers and Lecturers, Chapter IV Article 10, "Teacher competencies referred to in Article 8 include pedagogical competencies, personality competencies, social competencies, and professional competencies obtained through professional education". Based on this, teacher competence consists of four main competencies, namely pedagogical competence, personal competence, social competence, and professional competence.

Although it has been stated in the Law of the Republic of Indonesia Number 14 of 2005 Concerning Teachers and Lecturers, Chapter IV Article 10 concerning teacher competencies required, teacher competency tests in West Bandung Regency in 2017 data have not shown satisfactory results. Teacher competency data in the area of West Bandung Regency, seen from the results of the teacher competency test, is seen in the following picture.
While stated by Hasanudin (Sari, 2018) who is the Head of the Educator and Education Personnel Division at the West Bandung Regency Education Office that the Teacher Competency Test (UKG) in West Bandung Regency has only reached 69, while the standard of the Ministry of Education and Culture in Indonesia is 80. Based on the two data that have been stated, it can be seen that the competence of teachers in West Bandung Regency, especially teachers at the elementary school level, is still not excellent, so it is crucial to analyze the challenges of teachers in achieving the required competencies, and it is also necessary to conduct an activity of teacher competency development.

Teacher pedagogical competence is one of the four competencies that must be possessed by teachers at every level of education, including elementary school teachers in the area of West Bandung Regency. Therefore, the development of pedagogical competencies of elementary school teachers is something that must be considered in the development of the area in West Bandung Regency. Based on the attachment to the Minister of National Education Regulation No. 16/2007 dated May 4, 2007, the pedagogical competency standards that teachers must possess are as follows.
Table 1.
Teacher Competency Standards in the Minister of National Education Regulation Number 16 Year 2007 dated May 4, 2007

<table>
<thead>
<tr>
<th>Teacher Competence</th>
<th>Indicators</th>
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| Pedagogical Competence | + Mastering student characteristics from physical, moral, social, cultural, emotional, and intellectual aspects.  
| | + Mastering learning theories and principles of learning which educative.  
| | + Develop a curriculum related to the field of development that is being taught.  
| | + Carry out educational development activities.  
| | + Utilizing information and communication technology for the benefit of organizing educational development activities.  
| | + Facilitating the development of potential learners to actualize the various potentials they have.  
| | + Communicate effectively, empathically, and politely with students.  
| | + Carrying out assessment and evaluation of the process and learning outcomes.  
| | + Utilizing the results of assessment and evaluation for the benefit of learning.  
| | + Perform reflective actions to improve the quality of learning. |

The teacher's pedagogical competence must be relevant to the times, so the teacher is able to educate students according to their needs. Because we are now treading the industrial revolution 4.0 or also known as the digital era, teachers must understand the pedagogical competencies they need in the industrial revolution 4.0 era. Based on the research "Pedagogic in the Era of the Industrial Revolution 4.0" (Robandi, Kurniati, & Sari, 2019), the challenges of educators in the era of the industrial revolution 4.0 include competency in using digital technology and using it wisely, understanding the characteristics and potential of learners, and understanding humans and values humanity. Based on this, the relevance of teacher pedagogical competencies based on the Attachment to the Minister of National Education Regulation No. 16/2007 dated May 4, 2007, and the results of the research "Pedagogic in the Industrial Revolution Era 4.0" are as follows.
Table 2.
The relevance of Teacher Pedagogic Competency Indicators in Minister of National Education Regulation Number 16 the Year 2007 May 4, 2007, and Teacher Pedagogic Competency Indicators Based on "Pedagogic Research in the Industrial Revolution Era 4.0."

<table>
<thead>
<tr>
<th>Teacher Pedagogical Competency Indicator in Minister of National Education Regulation Number 16 the Year 2007</th>
<th>Indicators of Teacher Competence in the Industrial Revolution Era 4.0 Based on the &quot;Pedagogic Research in the Era of the Industrial Revolution 4.0&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Mastering students' characteristics from physical, moral, social, cultural, emotional, and intellectual aspects.</td>
<td>a. Having an understanding of students.</td>
</tr>
<tr>
<td>b. Carry out educational development activities</td>
<td>b. Having an understanding of human beings and human values.</td>
</tr>
<tr>
<td>c. Utilizing information and communication technology for the benefit of organizing educational development activities.</td>
<td>c. Rich information.</td>
</tr>
<tr>
<td>d. Facilitating the development of potential learners to actualize the various potentials they have.</td>
<td>d. Mastering the use of digital technology and the internet.</td>
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</tbody>
</table>

Based on the table, the teacher's pedagogical competencies relevant to the era of the industrial revolution 4.0 or the digital era, consist of at least four main competencies, namely 1) understanding the characteristics of students in the industrial revolution era 4.0; 2) utilize digital technology and digital information appropriately; 3) understand humanity and human values, and 4) helps students develop their potential.

Method
Bandung Regency in the Era of the Industrial Revolution 4.0". This activity involved 30 elementary school teachers in West Bandung Regency, precisely in Situbolang, Ciharashas, and Cimareme. The methodology used in this PKM activity is the delivery of material, discussion, and structured tasks. There are three topics presented, namely 1) authentic evaluation tools for elementary school teachers; 2) pedagogical competence of elementary school teachers in the industrial revolution era 4.0, and 3) the pedagogical role in the
development of digital literacy in elementary school teachers. The next activity is giving structured assignments about analyzing student attitudes in the industrial revolution era 4.0 and implementing attitude evaluation tools. The result findings of the activity were obtained through observation during the activity, namely how the teacher's response during the giving of the material, the response is given, and the questions raised by the teacher after the delivery of the material, include the first, second, and third topics.

Findings and Discussion

Findings

The findings of the activities include three main points, namely 1) the use of digital technology that educates in learning has not been widely applied; 2) understanding the characteristics of students and practical learning in the era of the industrial revolution 4.0 is not yet fully mastered by teachers, and 3) teacher enthusiasm in community service activities.

The Use of Digital Technology that Educates in Learning in Elementary Schools Has Not Been Much Applied

Although learning by applying digital technology has begun to be applied in schools, the number of uses of the technology is still minimal. The previous statement is because there is an assumption that digital technology might be an obstacle for students in the learning process. Another thing is that the facilities are not evenly distributed. The intended facilities include computers, the internet, and other supporting facilities. Teacher competence is also a challenge in the use of digital technology in learning. This information was obtained from the teacher's response when explaining the pedagogical competence of elementary school teachers in the industrial revolution 4.0 era.

Understanding of Student Characteristics and Effective Learning in the Industrial Revolution Era 4.0 Not Yet Completely Mastered by Teachers

Not only the use of digital technology, understanding the characteristics of students in the era of the industrial revolution 4.0 must be considered for the realization of effective learning.
Teacher competence in understanding student characteristics is part of the teacher's pedagogical competence. Based on the findings of the activities, the teacher was able to analyze some of the characteristics of students, for example, different types of student learning. However, to understand more deeply about the ability of teachers to understand student characteristics, it is necessary to conduct more in-depth research on teacher competencies related to understanding the characteristics of these students, especially their relation to the development of the digital era.

**Teacher's Enthusiasm in Community Service Activities**

The enthusiasm of the teacher when the activity began was very high. They seem to pay close attention and also ask critical questions at the end of the first topic. The teacher also points out the obstacles they face regarding the application of the topic presented by the presenter based on their experiences in school. However, after a break and lunch, the enthusiasm of the teacher decreased. Seen from some sleepy teachers and the reduced number of questions asked, as well as other responses given, for example, when the presenter gives a joke, only a few teachers respond. Likewise, when asked to respond, the teacher does not respond. Teacher responses and responses declined in the last topic (third topic).

Based on observations, the teacher's response decreased due to the time of activity. First, the time for giving the first topic ends before lunch. While the second topic which started after lunch, which is one o'clock in the afternoon. Similarly, the third topic was given after the completion of the second topic, which is around two in the afternoon. The teacher's focus decreases after rest and lunch, although the primary purpose of rest and lunch is to provide opportunities for teachers to get rid of tired for a moment. Next, related to the duration of the activity. The teacher was very enthusiastic about the first two hours of activity. However, after about two hours, the teacher's focus declined. The teacher looks exhausted. Community service that carried out after the teacher has finished teaching in class influence the teachers' exhaustion.

Another thing that affects teacher enthusiasm is the topic given. Teachers are more focused on practical topics, which are topics that they can directly apply in learning activities. The first topic guides the teacher to carry out authentic evaluations in the classroom. The presenter
explains how the teacher develops and uses authentic evaluations in learning. In contrast, the second topic is more theoretical, namely the delivery of pedagogical competence of teachers in the industrial revolution 4.0 or era, likewise, with the third topic, which raised the urgency of developing teacher digital literacy in elementary schools.

**Discussion**

It was stated earlier, that the teacher's pedagogical competencies relevant to the industrial revolution era 4.0 consisted of four main competencies, namely 1) understanding the characteristics of students in the industrial revolution era 4.0; 2) utilize digital technology and digital information appropriately; 3) understand humanity and human values; and 4) helps students develop their potential. Whereas the findings of the research revealed three main points, namely 1) the use of digital technology that educates in learning has not been widely applied; 2) understanding the characteristics of students and effective learning in the era of the industrial revolution 4.0 is not yet fully mastered by teachers, and 3) teacher enthusiasm in community service activities. Therefore, the discussion will be examined by teachers as lifelong learners related to the enthusiasm of teachers in receiving information and how they play a role in increasing student motivation; by setting an example that the teacher is a highly motivated learner. Then the teacher's competency in understanding the characteristics of students is also stated, namely how the teacher understands the characteristics of the students as a way to help students develop their potential. Another thing that is studied is education as a system - therefore, every component in education has an influence on the quality of education.

**Teachers as Lifelong Learners Inspire Students to Become Lifelong Learners**

Based on the findings of the activities that have been stated, there are two challenges of teacher enthusiasm in participating in training activities, namely 1) fatigue after teaching in the morning and then directly following the workshop activities; and 2) teachers are more interested in practical topics than theoretical. The workshop will be held after the teacher finishes teaching at school, which is around 10 am. Implementation time seems to be a challenge for the teacher's enthusiasm and focus. It can be seen after 1-2 hours of workshop activities that the focus and enthusiasm of the teacher...
decreases. At the beginning of the workshop, the teacher showed very high enthusiasm, this was indicated from the teacher's response to the topic given and the questions asked after the first topic was delivered. However, the enthusiasm of the teacher decreases after a few hours - the teacher looks sleepy, unfocused on the topic is given, and few questions are given. The workshop activities are carried out after the teacher's teaching hours are finished because teachers cannot implement them during class time and leave their students. Workshop activities are also not possible on holidays. When asked of the teacher, holidays are family days and to rest.

The previous explanation indicates the importance of choosing the right time to conduct training. In the community service activity "Developing Pedagogical Competence of Elementary School Teachers in West Bandung Regency in the Era of the Industrial Revolution 4.0", determining the implementation time has involved school principals and school supervisors. For the implementation of further activities, it is better to determine the timing of involving teachers as well. However, teachers personally need to try to overcome the fatigue that is felt when they are doing competency development activities. The teacher faces various challenges in his profession, including fatigue in teaching, the need to understand more deeply the knowledge taught, demands from government, as well as challenges in communication with students, colleagues, and parents (Clarà, 2017; Gu, 2018). Resilience and perseverance are essential for teachers so that they continue to try to develop themselves despite the various challenges felt in living their profession. It stated that resilience is one's ability to rise again after a severe setback, while perseverance is an ongoing effort to do or achieve something despite facing difficulties, failures, or conflicts (Merriam-Webster Online, 2019). Resilience and perseverance in life are complex and dynamic - the change can be caused by various things in the environment, including relationships with people around (Barners, 2017; Davidov, Knafor-Noam, Serbin, & Moss, 2015; Drew & Sosnowski, 2019; Masten & Barnes, 2018; Velleman & Templeton, 2016).

In the era of the industrial revolution 4.0, resilience and perseverance are essential for teachers to have. The era of the industrial revolution 4.0, also known as the digital era, presents challenges for teachers in mastering relevant competencies - such as digital literacy and technology literacy, as well as understanding student characteristics in the industrial revolution
era 4.0 (Robandi, Kurniati, & Sari, 2019). The development of resilience and perseverance is believed to be a competency that will help teachers deal with this era of disruption. Another challenge faced is that the teacher looks more enthusiastic in accepting the practical while learning the theoretical thing is not too enthusiastic. In the community service activity "Developing Pedagogical Competence of Elementary School Teachers in West Bandung Regency in the Era of the Industrial Revolution 4.0", three topics were presented by the presenters. The first topic is authentic evaluation tools in elementary school teachers - where teachers can directly apply this knowledge in learning. The topic helps teachers in developing and developing authentic evaluation tools. The questions raised also focus on the procedures for developing authentic evaluation tools and their use in the classroom. Whereas the second topic - pedagogical competence of elementary school teachers in the industrial revolution 4.0 era; and the third topic - the pedagogical role in the development of digital literacy in elementary school teachers. The second and third topics tend to present more fundamental theoretical concepts, not practical procedures like the first topic. The science of educating consists of practical teaching and theoretical teaching. Both of these educational sciences are important to be owned by teachers so that teachers will have a comprehensive teaching knowledge.

Based on the things that have been stated previously, namely how teachers must have high resilience and perseverance, as well as enthusiasm in learning and developing themselves, it is indicated that teachers must realize that they are lifelong learners continue to try to develop their potential.

**Teacher Competence in Understanding Student Characteristics**

In addition to being a lifelong learner teacher and inspiring students to be lifelong learners as well, teachers should have a good understanding of student characteristics. An understanding of student characteristics will help teachers in student learning engagement. As stated by Kellough (Jacobson & et al., 2009, p. 11), "You need to understand your students well so that later you can provide learning experiences, from which students will find something interesting, valuable, and intrinsically motivating, challenging, and useful to them." Based on the Teacher Pedagogical Competency Indicator in Minister of National Education Regulation
Number 16 the Year 2007 dated May 4, 2007, the characteristics of students that teachers must possess are physical, moral, social, cultural, emotional, and intellectual aspects. The previous statement indicates that teachers must understand the characteristics of students as a whole. Relevant to this, the study "Pedagogic in the Era of the Industrial Revolution 4.0" (Robandi, Kurniati, Sari, 2019) also suggested the importance for teachers to understand student characteristics. Because teachers educate students in different eras, which is now the era of the industrial revolution 4.0, teachers must understand the characteristics of students in the era of the industrial revolution 4.0. An understanding of the times and their relevance to the characteristics of students will help teachers formulate learning that is relevant and meaningful to students' lives. The teacher must be sensitive and understand the development of the world so that he is able to help students meet the needs of their lives by the times (Budi, 2014; Steiner, 1995a; 1995b; 1996; 2001).

It was stated that the characteristics of students in the era of the industrial revolution 4.0 tended to be more likely to seek information and socialize through digital media and social media (Robandi, Kurniati, Sari, 2019). However, the challenge for students, especially elementary school students, is that they have not been able to sort out what they have obtained from digital media and social media wisely. Therefore, guidance from educators, including teachers and parents, is essential for students. Even the cultivation of human values needs to be given in the 4.0 industrial revolution era. Because now human values are being ignored (Soenarko & Mujiwati, 2015).

**Education as A System: Each of Components Are Matter**

Education is a system where every component in education plays an essential and integrated role. As stated in the Law of the Republic of Indonesia, Number 20 the Year 2003 Regarding National Education System Article 1 Paragraph 3, "The national education system is all components of education that are interrelated in an integrated manner to achieve the objectives of national education." Therefore, education will run well as a whole when every component in the system is functioning correctly. What stated previously is also related to the lack of facilities felt by the teacher.
The education system consists of various integrated components, namely educational goals, students, educators (Brizenka, 1992, p. 43; Rasyidin, 2014, p. 86; Sadulloh, 2010, p. 84), educational content (Rasyidin, 2014, p. 86), and educational tools (Rasyidin, 2014, p. 86; Sadulloh, 2010, p. 84). The intended education tools include material and non-material tools. Non-material educational tools in the form of actions taken by teachers against students to achieve educational goals. Whereas material tools include facilities and infrastructure that support educational activities. Another obstacle to the development of teacher pedagogical competence in the era of the industrial revolution 4.0 is related to the fulfillment of relevant facilities, which is one form of material tools.

Fulfillment of relevant facilities is essential to develop pedagogical competence of elementary school teachers in the era of the industrial revolution 4.0. Based on an analysis of the results of activities, the fulfillment of educational facilities relevant to the industrial revolution 4.0 - such as computers and the internet, still needs to be improved. There are already computers and internet networks in several elementary schools participating in the development activities of pedagogical competencies of elementary school teachers in West Bandung Regency in the Era of the Industrial Revolution 4.0. However, these facilities have not been considered qualified. This is also closely related to the digital competence of teachers. It is hoped that the development of teacher digital competencies will increase if supported by training and supporting facilities (Anggraeni, 2011; Wardani, 2015).

**Conclusion**

In the community service program with the theme of pedagogical competence of elementary school teachers in West Bandung Regency in the era of the industrial revolution 4.0 obtained findings related to three obstacles to the development of teacher pedagogical competencies, namely as follows.

1. The use of digital technology that educates in learning has not been widely applied. This is related to the fulfillment of facilities that still need to be improved. Education is a system, so in addition to developing teacher competence, relevant facilities as other components in the education system must be considered.
2. Understanding of the characteristics of students and effective learning in the era of the industrial revolution 4.0 is not yet fully mastered by the teacher. It is crucial for teachers to understand the characteristics of students in the industrial revolution era 4.0 so that teachers are able to educate students according to their needs and the times.

3. Teacher enthusiasm in community service activities decreases at the end of the activity. Declining enthusiasm is caused by the development program conducted after the teacher finishes teaching until the afternoon, and teachers tend to be more enthusiastic about practical topics than theoretical studies on the second and third topics. In this regard, teacher resilience and perseverance must be increased. In addition, the teacher's awareness that teachers are lifelong learners also needs to be developed so that teachers can guide students to become lifelong learners too.

**Recommendations for Further Research and Community Service**

- This community service activity is only part of an effort aimed at increasing teacher competence, particularly in pedagogical competencies. There are still challenges during this community service program. Further research and community service are expected to answer the challenges experienced during this activity. The recommendations for further research and community service are as follows.

- Need to be studied more deeply about the tendency of teachers who are more interested in practical topics than theoretical studies, so that further research can examine these reasons. On another side, the community service program can further highlight the importance of the teacher in learning both practical and theoretical topics.

- Teachers are lifelong learners. Teacher competency development cannot be entirely successful in only one or two activities. Therefore, it is expected that there will be community service activities or other programs that will guide teachers to continue to develop their potential regularly. Periodic activities that may be carried out include the implementation of Lesson Study for teachers involving teachers, principals, and other experts, such as pedagogues, psychologists, and education offices.
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