

# Pedagogical Content Knowledge: Teachers' Competence Towards Learners with Special Needs in Online Learning

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## Abstract

The ongoing Covid-19 pandemic has had a tremendous impact on students, schools, and teachers. Learning for students is carried out in a limited manner through the agenda: work from home, study from home and worship at home as a form of preventing the spread of the virus. The limitations of online learning pose many challenges, including for teachers who still have to pass on their knowledge to students. Therefore, it is equally important to highlight how the pedagogical competence of teachers in improving the learning process during the Covid-19 pandemic. This study used a quantitative approach followed by a cross-sectional questionnaire. The sampling was done randomly in this study. The sample consisted of 623 teachers from 3 areas in West Java, namely, Bandung, Tasikmalaya, and Bekasi. The results of this study found that teachers still have difficulty in providing an effective learning process to accommodate the diverse needs of students, both in terms of content, methods, approaches, curriculum, educational services provided in the learning process as well as skills in the use of information technology. in today's digital era.

**Keywords:** *Online Learning; Pedagogical Content Knowledge; Students with Special Needs; Teacher Competence*

## Introduction

The World Health Organization (WHO) declared COVID-19 a global emergency on 30 January 2020 and a global pandemic on 11 March 2020. Currently, COVID-19 affects 213 countries and territories (WHO, 2020). In response to COVID-19, some countries have implemented physical distancing measures and lockdown policies. Clearly, the pandemic has had a tremendous impact on schools, students, and teachers. As of March 12, 2020, 46 countries across five different continents have announced school closures and 26 of these countries have closed schools nationwide (Huang, Liu, Tlili, Yang, & Wang, 2020). In Indonesia, the Government has limited community mobilization to prevent the spread of Covid-19 and continues to promote the agenda: work from home, learn from home and worship at home. Schools and Higher Education (HE) institutions in Indonesia have been temporarily closed since March 14, 2020.

To handle the closure of schools and HEIs in Indonesia, the teaching and learning process has been maintained remotely using Information and Communication Technology (ICT). Online learning has been considered the best approach to continue the teaching and learning process during the Covid-19 pandemic. This approach also applies to teachers in Special Schools (SLB).

Various ways and means of supporting learning are used to continue teaching and learning activities. For special schoolteachers, there is no other choice, and the learning process must continue for the sake of education for children with special needs with all their diverse and complex problems. Therefore, it is very natural that schools and teachers have limited or no experience of online learning and schools that have not prepared online learning resources will experience difficulties, especially, when teachers do not understand how to use online applications (Zaharah & Kirilova, 2020).

Most of the research on barriers to e-learning implementation is conducted in normal situations (e.g., Assareh& Bidokht, 2011; Hadijah&Shalawati, 2017; Juliane, Arman, Sastramihardja, &Supriana, 2017; Quadri, Muhammed, Sanober, Qureshi, & Shah, 2017), where the use of e-learning is optional to enhance the teaching and learning process. Studies investigating the use of e-learning during the pandemic are rare (e.g., Ash & Davis, 2009). Most of the studies conducted did not focus on mathematics (e.g., Al-Harbi, 2011; Astri, 2017; Kabilan & Khan, 2012). Moreover, it seems that most of the research on e-learning barriers was conducted in the context of HEIs (e.g., Osman, 2018; Panda & Mishra, 2007; Rabiee, Nazarian, &Gharibshaeyan, 2013). This poses many challenges but at the same time its importance also highlights the importance of investigating how teachers' pedagogical competence in improving the learning process during the Covid-19 pandemic.

Learning provided by teachers in any condition, including in the conditions of the Covid-19 pandemic, must be able to accommodate and develop not only the academic abilities of students, but also develop aspects of students' learning independence. If teachers are unable to accommodate independence and learning needs optimally, especially for students with special needs, it will have an impact on the ability of the students' independence. This situation provides many challenges that must be addressed quickly by teachers.

In fact, teachers are surprised that they must change systems, syllabi and learning processes quickly. Students stutter as they get piles of assignments/instructions while learning from home (MoEC, 2020). Meanwhile, parents feel stressed when accompanying their children with a learning process full of tasks, in addition, they have to think about their own survival and work in the midst of a crisis. These various difficulties have an indirect impact on the learning process and the ability of teachers' pedagogical competence in providing optimal learning to students, especially to students with intellectual disabilities.

### **Literature Review**

Teacher competence is the ability and authority of teachers in carrying out their teaching profession (Moh. Ali in Usman, 2013). Based on Permendiknas No. 27 of 2008 concerning Academic Qualification Standards and Teacher Competencies, it is stated that the competencies that teachers must have include four competencies, namely pedagogical, personality, social, and professional competencies.

Pedagogical Content Knowledge is knowledge that must be possessed by a teacher consisting of subject content and pedagogy. This knowledge will form an understanding of how topics, problems, or issues are organized, communicated, and used in learning according to students' interests and abilities (Abdullah, & Halim, 2010; Shulman, 1987). This understanding reflects that there is an element of art in learning. Another opinion states that Pedagogical Content Knowledge is the basic knowledge that teachers must have and need to guide them in analysing and making the right decision or taking any action in the learning process in the classroom (Atay et al., 2010; Abdullah, & Halim, 2010). Mastery of Pedagogical Content Knowledge will help teachers in facing and overcoming the difficulties of the learning process in the classroom, as well as trying to test, evaluate their teaching practices and to answer basic didactical questions (Abdullah, & Halim, 2010; Bucat, 2004).

Pedagogical competence is part of Pedagogical Content Knowledge where every teacher must have pedagogical competence. Pedagogical competence is a person's performance (ability) in the field of education. Hendayana et al (2007, p. 6-7) explain in detail, pedagogical competence includes: 1) understanding the characteristics of learners from physical, social, cultural, emotional, and intellectual aspects, 2) understanding the background of families, communities, learners and learning needs in the context of cultural diversity, 3) understanding learning styles and learning difficulties of learners, 4) facilitating the development of learners' potential, 5) mastering theories and principles of learning and educational learning, 6) developing a curriculum that involves learners in learning, 7) designing educational learning, 8) implementing educational learning, 9) evaluating learning processes and outcomes, 10) taking reflective action to improve learning quality.

Based on preliminary studies conducted through distributing questionnaires or surveys to high school / vocational schoolteachers in West Java regarding the actual conditions of teachers' pedagogical competence towards students with special needs, it appears that the average mapping of each competency of high school /

vocational schoolteachers is still in the low and medium average vulnerability. The low average vulnerable score is 0-3.9, for the medium average vulnerable is 4-7.9 while the average range for high scores is 8-10.

This range has implications related to the learning process both in terms of the quality of education, the impact on student learning independence and student motivation in participating in the online learning process. Thus, the focus of this article is to provide an overview of the competence of teachers in West Java in online learning for students with special needs.

### Research Method

This study used a quantitative method approach followed by a cross-sectional questionnaire (Fraenkel, Wallen, & Hyun, 2011). According to Fraenkel et al. (2011) quantitative methods are considered capable of providing reliable, valid, objective, and generalized findings. In addition, questionnaires, one of the most widely used quantitative instruments, can be administered to many participants. If researchers collect based on data from a representative sample of the population, generalizations can be made about the entire population (Fraenkel et al., 2011). The presentation and interpretation of qualitative methods is descriptive, and the data obtained is then analysed by descriptive methods (Ratna, 2013, p. 47).

Sampling was done randomly in this study. The sample consisted of 623 high school/vocational schoolteachers from 3 regions in West Java, namely, Bandung, Tasikmalaya, and Bekasi.

### Research Results And Discussion

#### *Objective Conditions of Pedagogical Competence of Teachers in West Java*

In the three (3) research areas in this study, it was found that in the Bandung area, there were 238 respondents of teachers who filled out the questionnaire with the overall average result of the average value of teacher pedagogical competence is 4.1 (moderate). The mapping and scores on each competency in table 1.

**Table 1. Pedagogical Competence of Teachers in Bandung Region**

Pedagogical Competence	1	2	3	4	5	6	7	8	9	10
Everage	3,8	3,9	3,9	4,2	4,1	3,9	4,3	4,3	4,2	4,1

In table 1, it can be described that there are 4 pedagogical competencies that are at low average vulnerability, namely competency 1 with a score of 3.8, competency 2 with a score of 3.9, competency 3 with a score of 3.9 and competency 6 with a score of 3.9. The four competencies include mastering the characteristics of students from physical, moral, spiritual, social, cultural, emotional, and intellectual aspects, learning theories and principles of educational learning, developing curriculum related to the subjects taught and facilitating the development of students' potential to actualize their various potentials.

Some of the efforts that have been made by senior high school teachers in the Bandung area in accommodating students with special needs include meeting the needs of facilities that support the development of their knowledge, for example conducting discussions on the procurement of the latest and latest teaching material sources, conducting individual counseling with students with special needs, coordinating with the Guidance and Counseling (BK) teacher in an effort to identify, determine treatment for students and it also coordinates with the parents concerned, as well as analyzing the background of student behavior, analyzing student needs, communicating with parents, coordinating with subject teachers and homeroom teachers to assess the appropriate strategies that will be used to these participants in the Teaching and Learning Activities (KBM) process. In the questionnaire results, teachers stated that they accept and try their best to develop the potential of

students with special barriers. This has implications for providing appropriate services for learners with special needs to get a good education as well.

High school teachers in the Bandung area revealed through answers to surveys or questionnaires what obstacles they faced and experienced, especially in relation to teachers' pedagogical competence and service delivery for learners with special needs. According to teachers in the Bandung area, the most common barriers faced include:

1. Theory is not always aligned with practice in the field because there are many inhibiting factors, especially the students themselves,
2. At the beginning of learning, there is still a lack of understanding of students and the development of students to actualize their various potentials,
3. Lack of facilities and infrastructure / tools that support the success of this education,
4. Difficulty in understanding the characteristics of different and diverse students.

From the answers of high school teachers in the Bandung area, it can be concluded that teachers still experience difficulties in providing an effective learning process to accommodate the needs of diverse learners, both in terms of content, methods, approaches, and educational services provided. This difficulty is a linear picture with the results of the pedagogical competence scores of teachers in the Bandung area presented in table 1 above.

The next research area, the Tasikmalaya area, had 69 respondents of Atasyang Secondary School teachers who filled out the questionnaire with the overall average score of teachers' pedagogical competence is 4.1 (medium). Mapping and scores on each competency as in table 2.

**Table 2: Pedagogical Competence of Teachers in Tasikmalaya Region**

Pedagogical Competence	1	2	3	4	5	6	7	8	9	10
Everage	3,8	3,9	3,9	4,2	3,8	3,9	4,3	4,3	4,3	4,2

In table 2, it can be described that there are 5 pedagogical competencies that are at low average vulnerability, namely competency 1 with a score of 3.8, competency 2 with a score of 3.9, competency 3 with a score of 3.9, competency 5 with a score of 3.8, and competency 6 with a score of 3.9. The four competencies include mastering the characteristics of students from physical, moral, spiritual, social, cultural, emotional, and intellectual aspects, learning theories and principles of educational learning, developing curriculum related to the subjects taught, utilizing information and communication technology for the benefit of learning, and facilitating the development of students' potential to actualize their various potentials.

Some of the efforts made by teachers in the Tasikmalaya area to accommodate students with special needs include conducting assessments during the admission of new learners (PPDB) and disseminating the results of the assessments to teachers and school community members, utilizing the role of peers to help children with disabilities and also utilizing counseling facilities from BK and providing special services and using certain learning methods that suit the needs of students with special needs. In the questionnaire results, most S teachers stated that they accepted and tried their best to develop the potential of students with special needs by providing good services, but it was found that one senior high school in Tasikmalaya still did not fully accept students on the grounds that these students should attend special schools (SLB) to get more appropriate learning accommodations. This implies that not all schools are ready for the practice of inclusive education, because there is still an assumption that students with special needs will only attend special schools.

Teachers in the Tasikmalaya area revealed through answers to surveys or questionnaires what obstacles they face and experience, especially in relation to teachers' pedagogical competence and service delivery for students with special needs. According to teachers in the Tasikmalaya area, the most common barriers faced include:

1. Lack of ability of teachers to be able to provide educational services for students, especially students with special needs due to the difficulty of understanding the characteristics of diverse students and the difficulty of implementing a curriculum that is always changing.
2. Lack of facilities for teachers, especially guidebooks and teaching aids,
3. Lack of training facilities to improve teachers' pedagogical competence,
4. Lack of information technology skills mastered by teachers in accessing information and tasks.

From the results of the answers of the teachers in the Tasikmalaya area, it can be concluded that teachers still experience difficulties in providing an effective learning process to accommodate the needs of diverse learners, both in terms of content, methods, approaches, curriculum, educational services provided in the learning process and skills towards the use of information technology in the current digitalization era. This difficulty is a linear picture with the results of the pedagogical competence scores of teachers in the Tasikmalaya region presented in table 2 above.

The last or third research area, Bekasi, had 316 respondents' high school/vocational schoolteachers who filled out the questionnaire with the overall average score of teachers' pedagogical competence being 4.1 (medium). Mapping and scores on each competency as in table 3.

**Table 3. Pedagogical Competence of Teachers in Bekasi Region**

Pedagogical Competence	1	2	3	4	5	6	7	8	9	10
Everage	3,8	3,8	3,9	4,1	4,2	3,9	4,3	4,3	4,3	4,1

In table 3, it can be described that there are 5 pedagogical competencies that are at low average vulnerability, namely competency 1 with a score of 3.8, competency 2 with a score of 3.8, competency 3 with a score of 3.9, and competency 6 with a score of 3.9. The four competencies include mastering the characteristics of students from physical, moral, spiritual, social, cultural, emotional, and intellectual aspects, learning theories and principles of educational learning, developing curriculum related to the subjects taught, and communication for the benefit of learning and facilitating the development of students' potential to actualize their various potentials.

Some of the efforts that have been made by teachers in the Bekasi area in accommodating students with special needs include taking a special approach and motivation and providing understanding to children who are not experiencing obstacles, teachers' pay special attention, teach privately after teaching other children, teachers naturally have the initiative to call students with special needs outside of class hours and then give a little direction about the material that he previously had difficulty understanding and provide additional explanations via WhatsApp. Teachers also try to utilize study groups during the KBM. In the questionnaire results, the teachers in the Bekasi area stated that they accept and try to provide the same treatment as students who do not have obstacles. When viewed from the teachers' answers to the acceptance of students with special needs, it is good, because the teachers have accepted the existence of these students, but what is noted is the concept of "equalizing" each individual student who must still be straightened out so that this implies that not all schoolteachers understand and understand the characteristics of diverse students, especially in inclusive class or learning settings.

Teachers in the Bekasi area revealed through answers to surveys or questionnaires what obstacles they face and experience, especially in relation to teachers' pedagogical competence and service delivery for students with special needs. According to teachers in the Bekasi area, the most common barriers faced include:

1. Lack of competence in handling students with special needs because the teacher's educational background is not appropriate or does not come from special education,
2. Teachers' pedagogical competence is also linked to parental guidance for students at home, the efforts made by teachers at school will be in vain without parental support at home, at this point teachers hope for cooperation and collaboration in improving the learning process between teachers and parents,
3. Skills in the adjustment and use of technological information developments for teachers.

From the results of the answers of teachers in the Bekasi area, it can be concluded that teachers still experience difficulties in providing an effective learning process to accommodate the needs of diverse learners, both in terms of content, methods, approaches, curriculum, educational services provided in the learning process and skills in the use of technological information in the current digitalization era. This difficulty is a linear picture with the results of the pedagogical competence scores of teachers in the Tasikmalaya area presented in table 3 above.

Based on the results of survey answers or questionnaires asked to teachers related to efforts made in improving pedagogical competence by the Office. The West Java Education Office and the local Education Office have provided several inhouse training activities, training, activities such as training, training, socialization, and counselling, then directing teachers to participate in workshops or discussions that have to do with the subjects they teach. Apart from these activities, to create a culture of learning, the related office also conducts upgrading for outstanding teachers, or competitions in the academic field that not only involve students but also teachers as teachers and mentors to hold teacher competency tests per semester. With so many activities, it is expected that teachers' pedagogical competence can be better. However, these expectations have not fully accommodated the need to improve teacher competence at this inclusive level.

Some of the field facts stated by teachers through questionnaires are a separate note for the Office that has provided and facilitated the need to improve teachers' pedagogical competence. According to them, teachers are very fixated on the guidelines or technical guidelines, or models provided by the central curriculum, and do not develop learning models based on their potential and pedagogical experience because teachers are mostly seen based on how accurately they implement the pedagogical model (rather mechanistic, especially in relation to learning syntax), not on the learning outcomes or expected competency standards. In addition, teachers also stated that their lack of skills to learn more varied learning methods resulted in their skills in dealing with students with special needs in the classroom.

#### *Teachers' Pedagogical Content Knowledge in Improving the Online Learning Process for Learners with Special Needs*

Content and pedagogical knowledge are two things that cannot be separated in every learning. that Pedagogical Content Knowledge is a combination of content and pedagogical knowledge in understanding how certain topics and materials or problems are organized. that Pedagogical Content Knowledge is no longer considered just an educational theory but rather a form of representation of how they can develop professional knowledge in their teaching practice (Loughran, et al., 2008). Teacher figures who can master the ability that Pedagogical Content Knowledge well can provide creative and innovative ideas in preparing lesson plans, this innovative learning will bridge the gap between content and pedagogical science teachers and cause meaningful learning for students (Nuangchalerm, 2011).

Based on the findings and analysis of the objective conditions of pedagogical competence of SMA / SMK teachers in three regions, namely Bandung, Tasikmalaya and Bekasi, each of the regions if observed has obstacles in aspects of pedagogical competence on 1) understanding the characteristics of students from physical, social, cultural, emotional, and intellectual aspects, 2) understanding family background, 2)



understanding family background, community, students and learning needs in the context of cultural diversity, 3) understanding learning styles and learning difficulties of students, 6) developing a curriculum that involves students in learning, and also in the Tasikmalaya region there is a value gap or vulnerability in competence in aspect 5) mastering theories and principles of learning and educational learning.

With this data and information, it is hoped that the agency and schools can follow up on this by providing stimulation and providing space for a lot of collaboration with not only internal school parties but also external parties.

Understanding the characteristics of learners from physical, social, cultural, emotional, and intellectual aspects is an aspect of initial pedagogic competence that is the basis for teachers to understand the religiosity of students, especially if students are in a learning setting in schools that organize inclusive education. In addition, aspects of competence regarding understanding the background of families, communities, students and learning needs in the context of cultural diversity support a more inclusive learning process and are also relevant to the learning needs of students. Teachers must be able to be present not only as a figure who provides services in terms of knowledge transfer but also as a facilitator to develop a better learning process, especially in the context of online learning.

After these two aspects, no less important is the aspect of pedagogical competence regarding understanding learning styles and learning difficulties of students. Learning style according to Bobbi De Porter & Mike Hernacki (2001) is the key to developing performance at work, at school, and in interpersonal situations. Another opinion, learning style is defined by Keefe (1979) as a combination of cognitive characteristics, affective, and physiological factors that serve as a relatively stable indicator of how the learner perceives, interacts, and responds to the learning environment (Wiedarti, 2018). A person's learning style is a combination of how he absorbs, and then organizes and processes information. Experts call the activity of absorbing information easily with the term "modality". Meanwhile, how to organize and process information is known as "brain dominance". The learning styles in question can be divided into visual, auditorial and kinesthetic (V-A-K). From some of these definitions, it can be understood that a person's learning outcomes are influenced by the way they absorb information when learning in any context takes place, whether it is learning in the classroom, or outside the classroom.

Developing a curriculum that involves learners in learning and mastering the theories and principles of learning and educational learning is a part that must also be explored and expressed in teachers. A learning process requires not only technological skills but also the ability of teachers to develop curriculum and master the principles of educational learning for children with special needs. Many things and factors must be adjusted in the online learning process, and collaboration and coordination with parents is an important part of the teacher to continue to improve children's abilities and development during this online learning.

Thus, the Pedagogical Content Knowledge that teachers must continue to develop in improving the online learning process for students with intellectual disabilities is about the subject content and pedagogy itself. Thus, this knowledge will form an understanding of how topics, problems, or issues are organized, communicated, and used in learning according to the interests and abilities of learners (Abdullah, & Halim, 2010; Shulman, 1987).

## Conclusion

This study aims to provide an overview of Pedagogical Content Knowledge in the pedagogical competence of teachers in developing an online learning process for students with special needs where it is found that pedagogical competence related to 1) understanding the characteristics of students from physical, social, cultural, emotional, and intellectual aspects, 2) understanding the background of family, community, students and learning needs in the context of cultural diversity, 3) understanding learning styles and learning difficulties of students, 6) developing a curriculum that involves students in learning, and 5) mastering theories and principles of learning and educational learning are the basis for improving Pedagogical Content Knowledge in the future.

There are several considerations in compiling the pedagogical components that must be owned by a teacher in intervening in the online learning process, namely the prerequisites in understanding the characteristics of students through the assessment process, determining the curriculum, besides that, online learning techniques must be adjusted and modified according to the conditions of each child. This research can contribute to developing professional teachers, especially in providing interventions and innovations in the online learning process for students with special needs.

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