

# Strategies for Improving Teacher Pedagogic Competence Industrial Revolution Era 4.0 Word

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## ABSTRACT

This type of research is field research. The subjects of the research were principals and teachers at SMP Muhammadiyah PK Kottabarat Surakarta and SMP Muhammadiyah Al-Kautsar PK. Furthermore, the objects of this research were pedagogical competence and strategies to improve pedagogical competence in the era of Industrial Revolution 4.0, SMP Muhammadiyah PK Kottabarat Surakarta, and SMP Muhammadiyah Al-Kautsar PK. This research employed a case study approach. Thus, data collection was originally from the interview, observation, and documentation. This study concluded that the teachers' pedagogical competence in the era of Industrial Revolution 4.0 at SMP Muhammadiyah PK Kottabarat Surakarta and SMP Muhammadiyah Al-Kautsar PK, had good pedagogical competence, according to pedagogical competency standards of Permendikbud No. 16 of 2007. Teachers understood the character of students through habituation, study assistance, and parent interviews. The teachers understood learning theory and how to develop a curriculum based on al Islam Kemuhammadiyahan curriculum, and sharia curriculum. The teachers created learning tools, models usage, strategies, or selecting learning methods. Teachers employed integrated learning technology and educational platforms like YouTube, zoom, PK Learning, and Edmodo. The teachers provided evaluations in the form of tests, PTS, PAS, and remedial tests. However, they analyzed the assessment results to comprehend the development of students through extracurricular programs, Talent classes, and OSN. The strategy to improve teachers' pedagogical competence was conducted through various educational, training, seminars, supervision, MGMP, scientific studies, and rewarding, training of Tahsin and Tahfidz, Islamic studies through teachers studies, PDM and PCM studies, training graphic design, and IT-based learning applications training.

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## INTRODUCTION

The development of the world of education in the era of the Industrial Revolution 4.0 is marked by the development of technological science. This factor triggers educators, researchers and policymakers to compile the concept of education in the era of the Industrial Revolution 4.0 in the form of 21st-century education documents. The characteristics of the world of education in the 21st century can be formulated as follows, (a) there are automatic machines that can replace human work, (b) globalization and massive technological developments, (c) skilled labor, (d) science that is increasingly focused and pursued, (e) the emergence of environmental issues, (f) improvement of the service sector that offers easy, effective and efficient access [1], [2], [3], [4], [5], [6].

Educational institutions must prepare themselves to face the era of the Industrial Revolution 4.0. Several things must be prepared by school institutions, including (1) preparing students to get used to using technology in learning, (2) designing approaches, methods, and learning models and utilizing technology to provide support to students to think critically and creatively (3) hone HOTS skills in the learning process. HOTS (Higher, Order, Thinking, Skills), (4) Design of developing the quality of teacher competence in the era of the Industrial Revolution 4.0 [7], [8], [9], [10], [11].

According to Dewi Surani, at least a teacher must have the qualifications and competencies needed in the era of the Industrial Revolution 4.0. First, Educational Competency, teachers must have educational competence by complaining about internet technology as a basic ability in the millennial era. Second, in Competency Four technological commercialisation, teachers have the competence that students have attitudes and entrepreneurship by complaining about technology on the results of student innovation work. Third, Competency in globalization, teachers must understand that the world is without barriers so that teachers are expected not to stutter in facing cultural issues and have hybrid competence that can solve national problems [12].

Fourth, Competency in future strategies, teachers must understand that the world is experiencing very rapid changes. teachers must be able to provide predictions with respect to what will happen in the future. Fifth, Counselor competency, understanding students' abilities and providing psychological motivation so as to increase students' enthusiasm for learning. Yusnaini explained that teachers facing the era of the industrial revolution 4.0 must be able to improve and develop their understanding in the field of literacy, teachers who are able to understand information will be able to find analysis and solve educational problems through digital literacy [13].

Education in the era of the Industrial Revolution 4.0 provides demands for teachers to have abilities in the fields of technology and information. Teachers as the spearhead of education must be able to adapt and increase innovation in the field of technology and information. Teachers who have the ability in the field of technology and information are expected to play a role in improving the quality of the learning process with creative, innovative and fun learning. Improving the quality and competence of teachers is needed in order to design effective and efficient education [14].

Conditions in the field illustrate that teacher competence in Indonesia must always be improved. The problem of pedagogic competence of teachers in Indonesia includes low teacher competence so it needs to be improved, (b) low teacher motivation in terms of self-development, (c) lack of enthusiasm in scientific discussions, seminars, and workshops (d) lack of ability to write scientific journals, the ability to master technology and information is still minimal. According to Akadum (1999), the low professionalism of teachers can be caused by several factors. The factor that causes low teacher competence is that most teachers do not pursue their profession optimally because teachers have to find additional income, there are no professional teacher standards like developed countries, there are still many teachers who do not comply with teacher professional ethics and there is no strong motivation to improve teacher competence [15].

Rifma expressed the opinion that there are still problems with teacher pedagogic competence. The problem with teacher competence is that the teacher's ability to compile learning tools is still lacking because teachers compile lesson plans and syllabi in groups and copy files without knowing their respective school backgrounds. The ability of teachers to understand learning strategies and methods is still lacking, so the KBM process runs monotonously and less interesting. Teacher service to students is less than optimal, as an example is that teachers do not want to listen to student opinions and tend to be angry with students who are active and critical [16].

On the other hand, the use of smartphones has experienced tremendous development. Students have the ability to operate Smartphones in various fields, ranging from seeking knowledge, and making friends through social media, even less productive things can be accessed by students. Meanwhile, the ability of teachers in the internet field is still very lacking, especially teachers who are over 40 years old. Teachers who are actually elderly will find it difficult to use internet access. Therefore, in order to face the era of Industrial Revolution 4.0 education, efforts are needed to improve teacher competence [17].

Teachers are an important factor in improving the quality of education in the era of the Industrial Revolution 4.0. Improving the quality of education will have a positive impact on the progress of the Indonesian nation and state. In order to improve education in Indonesia, professional teachers are needed. Teacher competence in the era of the Industrial Revolution 4.0. according to the National Educational Technology Standard Framework (NETS). The core standards that should be owned by teachers in the 21st century or the era of the Industrial Revolution 4.0 are: (a) teachers are able to provide facilities and are able to inspire and provide creativity in teaching by integrating digital technology, (b) teachers as educators must be able to design and develop learning based on technology and information, (c) teachers must be able to set an example as responsible digital citizens, (d) The teacher must be continuous to develop his professional abilities [18].

The competence that must be developed by the teacher is Pedagogic competence. Pedagogic competence is the ability and skill of teachers to manage learning and interacting with students, both from various aspects such as moral, emotional, and intellectual. This implies that teachers are expected to have the ability to master learning theories and learning principles, because students have different characters, traits, and interests. With regard to curriculum implementation, a teacher must be able to develop a curriculum at the level of each educational unit and adapted to local needs [19].

Educational institutions must prepare strategies in order to improve teacher competence in the era of Education 4.0. Strategies that can be carried out by educational institutions include: (a) improving the ability of educators by participating in relevant training activities, for example by attending seminars, webinars, and workshops, (b) providing technology training for educators so that they become creative and innovative individuals open to new thoughts, such as graphic design training, learning videos, (c) providing career coaching and creating a good working atmosphere, (d) conducting academic supervision regularly, (e) Teachers follow the KKG and MGMP programs to improve teacher competence, deliberation, motivation, and exchange creative and innovative ideas so that learning activities can be carried out effectively and efficiently, (f) provide understanding through the use of technology in learning, for example the use of e-learning and zoom applications, and Google Meet [20].

Pedagogic competence of teachers is needed in improving the quality of education in the era of the Industrial revolution 4.0. The government has made great efforts in compiling teacher competency standards as an indicator of teachers in carrying out their obligations. Teacher pedagogic competency standards have been regulated in Permendikbud No. 16 of 2007. According to E.Mulyasa, pedagogic competence is the teacher's ability to manage student learning. Pedagogic competencies include understanding educational insights, understanding students, curriculum/syllabus development, learning design, learning implementation, technology utilization, evaluation of learning outcomes, development of students in developing their potential. Rifma said that pedagogic competence is a competence related to educational principles, educational objectives, educational materials and infrastructure, and teaching methods and all forms of relationships (educative interactions) between educators and students in order to provide provisions towards a positive direction, becoming a mature and independent person [21].

In order to face the era of industrial revolution education 4.0, teacher competence must be developed. Steps that can be taken in order to develop teacher competence based on the Balitbang Diknas document include the need for revitalization and control mechanisms for teacher training that are specific and focused, and an assessment system that is compiled systematically and periodically in order to determine the effectiveness and impact of teacher training. The government also strives to improve teacher competence through pre-service education, in-service education, upgrading, organizational education, enforcement of codes of ethics, and certification [22].

Based on the background described above, researchers tried to study about: How is the pedagogical competence of teachers in SMP Muhammadiyah PK Kottabarat and SMP Muhammadiyah Al-Kautsar PK?, What is the school's strategy to improve the pedagogic competence of teachers in the industrial revolution era 4.0 at SMP Muhammadiyah PK Kottabarat and SMP Muhammadiyah Al-Kautsar PK.

## METHODOLOGY

This research uses a qualitative research paradigm. The research paradigm was introduced by Thomas Kuhn and reintroduced by Friedrich. The research paradigm is a framework that explains how researchers view the facts of social life and the treatment of researchers towards science or theory. This type of research is qualitative descriptive field research. Descriptive research analysis aims to describe, summarize various social conditions that exist in society that are the object of research in the form of characteristics, characters, traits, sign models, descriptions of certain conditions, situations according to facts in the field. Describe the pedagogical competence of teachers in SMP Muhammadiyah PK Kottabarat and SMP Muhammadiyah Al-Kautsar PK and describe strategies to improve the pedagogic competence of teachers in the era of industrial revolution 4.0 at SMP Muhammadiyah PK Kottabarat and SMP Muhammadiyah Al-Kautsar PK.

This research is qualitative research using Case Study Approach. The case study approach according to crasswel is a type of approach used in order to investigate events or problems that have occurred in the community, then try to collect various information obtained and then provide solutions so that problems can be resolved completely.

This study used two data sources, namely primary data sources and secondary data sources. Primary data is data obtained by a researcher directly from the source. Primary data sources are taken from the interview process and field observations, including through the interview process of principals and teachers related to strategies to increase teacher pedagogic competence in the industrial revolution era 4.0. at SMP Muhammadiyah PK Kottabarat Surakarta and SMP Muhammadiyah Al-Kautsar PK. The secondary data is data obtained by a researcher through second data, for example from people or documents.

Secondary data sources are data obtained from the second source, in the form of documents and research results, including historical documents of the establishment of schools, school profiles, vision, mission, personnel management goals, school programs relevant to the era of industrial revolution education 4.0 SMP Muhammadiyah PK Kottabarat Surakarta and SMP Muhammadiyah Al-Kautsar PK. The object of this research is carried out at SMP Muhammadiyah PK Kottabarat Surakarta and SMP Muhammadiyah Al-Kautsar PK in February - June 2021. The subjects of the research conducted by the author are principals, vice principals and educators at SMP Muhammadiyah PK Kottabarat Surakarta and SMP Muhammadiyah Al-Kautsar PK for the 2020/2021 academic year. The data collection method uses observation methods, interview methods, and documentation methods. The data analysis methods used by researchers are descriptive and deductive. Descriptive analysis method is an analytical method used to obtain data in the form of words, images and behavior written in word form to describe problems that are natural or human engineering. One form of study is educational and learning activities. Data analysis from Miles and Hubberman starts from data collection, data reduction, data disclosure (data presentation), and conclusions.

## RESULTS AND DISCUSSION

### Pedagogic Competence of Teachers at SMP Muhammadiyah PK Kottabarat

Based on data in Chapter II and Chapter III, the researcher provided an analysis related to strategies to increase teacher competence in SMP Muhammadiyah PK Kottabarat and SMP Muhammadiyah Al-Kautsar PK. The discussion to be analyzed is divided into two, namely the pedagogic competence of teachers at SMP Muhammadiyah PK Kottabarat

and SMP Muhammadiyah Al-Kautsar PK and strategies for increasing teacher pedagogic competence in the era of the industrial revolution 4.0. From the results of research conducted at SMP Muhammadiyah PK Kottabarat Surakarta related to improving the pedagogic competence of teachers in the era of industrial revolution education 4.0, researchers found interesting data related to teacher competence at SMP Muhammadiyah PK Kottabarat Surakarta. The data obtained by researchers related to pedagogic competence include:

Teachers master the character of students from physical, moral, spiritual, social, cultural, emotional and intellectual aspects: Teachers at SMP Muhammadiyah PK Kottabarat Surakarta understand the characteristics of students through morning mentoring via zoom, worship assistance, weekly studies and monthly studies, and through learning activities, through POMG and discussions with parents [23].

Teachers master educational theories and principles: Teachers prepare for the school year by collecting learning tools and directly gaining supervision. Among the learning tools that must be collected are educational calendars, annual programs, semester programs, syllabi, lesson plans, lesson schedules, daily agendas, kkm documents; attendance list, grade list, teacher manual, textbook. Teachers at SMP Muhammadiyah PK Kottabarat Surakarta have taken Strata 1, Postgraduate education and teach according to their competence. The number of teachers who have taken S2 is 3 teachers, namely Mr. Muhdiyatmoko, Mr. Dafit, and Mr. Miftakhul. The number of those who have received educator certificates is 9, namely Mr. Muhdiyatmoko, Mr. Heru, Mr. Nanang, Mr. Ary, Mr. Bani, Mrs. Latif, Mrs. Puji, Mrs. Sukma, Mrs. Yuyus [24].

Educational curriculum development: Teachers use Kurikulum K13, Al-Islam and Kemuhammadiyahan Special Characteristics Curriculum and developed with Sharia Science curriculum. The process of developing the Sharia Science Curriculum is built with five subjects, namely having the basis of the Qur'an, equipped with hadith, in accordance with the national curriculum, using an approach to Indonesia's natural wealth, international developments [25].

Teachers utilize information and communication technology: Muhammadiyah PK Kottabarat Junior High School teachers use computers, laptops, LCD projectors in learning. Learning using diverse educational platforms such as zoom, google class room, K-hoot, Edlink, Youtube, PK E-Learning School Application, canva design platform, pothoshop, corel in accordance with the education era of the Industrial revolution 4.0 [26].

Teachers facilitate the development of student potential: Muhammadiyah PK Kottabarat Junior High School teachers develop students' potential through extracurriculars, kat classes, OSN, additional National Assessments, Recitations and webinars. The teacher also gives direction to students to take part in extracurriculars according to the interests and talents of students. The school also provides the highest award for students who get competition championships in the form of scholarships, coaching money and flyers [27].

Teachers communicate effectively, empathetically, and politely with students: Culture of smiles, greetings, greetings, greetings students politely and politely, for example by calling "mas or mbak". Educator Quality Standards at SMP Muhammadiyah PK Kottabarat Surakarta have been regulated in a system of values and norms. Educators at SMP Muhammadiyah PK Kottabarat Surakarta must have the following personalities: collectivity, hard work and mutual assistance, independence, respect and care, integrity and confidence, nationalist, peace-loving, democratic, and humanist, religious and prayerful, disciplined, productive and exemplary, smile, happiness and sincerity, professionalism, achievement and unpretentiousness, honesty, loyalty, commitment and consistency [28].

Teachers provide assessment and evaluation of learning processes and outcomes: Teachers of SMP Muhammadiyah PK Kottabarat provide assessment and evaluation of learning processes and outcomes through daily assignments in the form of projects and portfolios, daily tests, midterm assessments and end-of-semester assessments. The teacher also provides additional lessons to all students before PTS or PAT by strengthening the understanding of the material to students, in the form of additional questions, and grid discussions. Teachers also have

religious report cards that contain worship achievements and Qur'an memorization achievements. Teachers also have BK report cards which are used as an assessment of students' attitudes in following learning [29].

Utilizing the results of assessment and evaluation for the benefit of learning: Teachers of SMP Muhammadiyah PK Kottabarat utilize the results of assessment and evaluation for the benefit of learning by preparing remedial programs and providing enrichment programs for students in preparation for competitions. The teacher provides an analysis of PTS and PAS question items in order to measure the level of difficulty of the questions and measure student understanding that will be collected to the Waka Curriculum [30].

### **Pedagogical Competence of Teachers of SMP Muhammadiyah Al-Kautsar PK**

From the results of research conducted at SMP Muhammadiyah Al-Kautsar PK related to increasing the pedagogic competence of teachers in the era of industrial revolution education 4.0, researchers found interesting data related to teacher competence at SMP Muhammadiyah Al-Kautsar PK. The data obtained by researchers related to pedagogic competence include:

Teachers master the character of students from physical, moral, spiritual, social, cultural, emotional and intellectual aspects: SMP Muhammadiyah Al-Kautsar PK has an excellent program called Comprehensive Guidance. Comprehensive Guidance is a series of systems arranged to provide comprehensive assistance to students. Comprehensive Guidance consisting of Spiritual Guidance, Social Guidance, Long life Guidance, Academic Potencial Guidance, Character Guidance, and Health Guidance [31].

Teachers master educational theories and principles: Teachers prepare for the school year by collecting learning tools. Among the learning tools that must be collected are educational calendars, annual programs, semester programs, syllabi, lesson plans, lesson schedules, daily agendas, kkm documents; attendance list, grade list, teacher manual, textbook. The number of teachers of SMP Muhammadiyah Al-Kautsar PK who have taken S2 is 2 teachers, namely Mr. Mujib and Mr. Fauzi. The number of teachers of SMP Muhammadiyah Al-Kautsar PK who have teaching certificates is 6, including Mr. Mujib, Mr. Fauzi, Mrs. Desi, Mrs. Erna. Teachers develop educational curriculum: Teachers use Kurikulum K13, Al-Islam Special Characteristics Curriculum and Kemuhammadiyah [32].

Teachers utilize information and communication technology: Teachers of SMP Muhammadiyah Al-Kautsar PK utilize technology in learning such as the use of computers, laptops, LCD projectors in learning. Learning using the education platform zoom, youtube, and Edmodo is in accordance with the education of the Industrial revolution era 4.0. Teachers personally prepare learning videos and are allowed to arrange settings according to the material [33].

Teachers provide facilities for developing student potential: Teachers of SMP Muhammadiyah Al-Kautsar PK develop students' potential through extracurriculars, additional OSN, recitation and webinars. The school also provides the highest award for students who get competition championships in the form of scholarships, coaching money and flyers. There are full scholarships for students who are prestigious orphans [34].

Teachers carry out communication effectively, empathetically, and politely with students: Culture of smiles, greetings, greetings, greeting students politely and politely, for example with the title "mas or mbak". Assessment and evaluation of learning processes and outcomes: Teachers of SMP Muhammadiyah Al-Kautsar PK provide assessment and evaluation of learning processes and outcomes through daily assignments, daily tests according to basic competencies, midterm assessments and end-of-semester assessments, attitude and daily assessments [17].

Teachers utilize the results of assessment and evaluation for the benefit of learning: Teachers of SMP Muhammadiyah Al-Kautsar PK utilize the results of assessment and evaluation for the benefit of learning by preparing remedial programs and providing enrichment programs.



## Strategies to Increase Teacher Pedagogic Competence at SMP Muhammadiyah PK Kottabarat

The strategic plan of SMP Muhammadiyah Al-Kautsar PK in order to improve the pedagogical competence of teachers in the era of the industrial revolution 4.0 is Training in the form of Workshops and Seminars: Strategies for improving teacher pedagogic competence at SMP Muhammadiyah Al-Kautsar PK with Training in the form of Workshops and Seminars, including GTK workshops on strengthening pedagogic competence and strengthening teacher character, GTK workshops on strengthening pedagogic competence and ice breaking training and question writing workshops with the concept of in-house training [35].

Implementing Science and Technology-Based Learning Innovations: Strategies to increase teacher pedagogic competence at SMP Muhammadiyah Al-Kautsar PK by implementing learning innovations based on science and technology. The activity was carried out by carrying out zoom and Edmodo training, youtube-based learning media training and school youtube development and In House Tryning [25], [36], [37], [38].

Teachers follow MGMP: Strategy to increase teacher pedagogic competence at SMP Muhammadiyah Al-Kautsar PK by encouraging teachers to be active in MGMP activities. MGMP activities attended by teachers of SMP Muhammadiyah Al-Kautsar PK were participating in MGMP Sukoharjo Regency, MGMP Muhammadiyah School Sukoharjo Regency, and MGMP private teachers Sukoharjo Regency.

Performance Assessment-Based Education and Development Supervision Program: teachers attend the principal's supervision every new school year. In addition, teachers and employees also follow the supervision of educators and education personnel with tentative time [39]. Establishment of IT Special Division: The strategy to increase the pedagogical competence of teachers in the era of the industrial revolution 4.0 is to prepare a special team in providing IT facilities and services. SMP Muhammadiyah Al-Kautsar PK has an IT Team that is given the task of managing podcast studios, youtube studios, study studios, and everything in the form of digitization [40]. Awarding: SMP Muhammadiyah Al-Kautsar PK gives awards to exemplary teachers every month and provides S2 scholarships for dedicated teachers.

## CONCLUSION

SMP Muhammadiyah PK Kottabarat Surakarta and SMP Muhammadiyah Al-Kautsar PK have good pedagogic competence and are in accordance with pedagogic competency standards based on Permendikbud No.16 of 2007. Teachers have utilized technology in the form of computers, laptops, LCD projectors. SMP Muhammadiyah Kottabarat Surakarta has a special application for PK E-Learning schools. Teachers develop the potential of students through extracurriculars, kat classes, OSN, additional National Assessments, and webinars. Teachers also communicate effectively, empathetically, and politely with learners with a culture of smiles, greetings, greetings. Junior high school teachers provide assessments and evaluations through daily assignments, daily tests, midterm assessments and end-of-semester assessments, religious report cards, BK report cards and provide additional PTS or PAT preparation lessons. Teachers of SMP Muhammadiyah PK Kottabarat utilize the results of assessment and evaluation, remedial programs, enrichment programs. The teacher provides an analysis of PTS and PAS question items in order to measure the level of difficulty of the questions and measure student understanding that will be collected to the Deputy Head Curriculum.

The strategy of increasing pedagogical competence of teachers in the industrial revolution era 4.0 at SMP Muhammadiyah PK Kottabarat Surakarta and SMP Muhammadiyah PK Al-Kautsar Kartasura has been implemented well and in accordance with Law No. 14 of 2005 The strategy of increasing pedagogic competence of teachers in the era of revolution 4.0 at SMP Muhammadiyah PK Kottabarat Surakarta through workshops, seminars and MGMP. Establishment of a special division of IT services in providing facilities for successful learning. Awarding outstanding and dedicated teachers in the form of charters, trophies, allowances and further study education, tahsin, tajweed and tahfidz training for teachers and employees, Islamic studies through teacher studies, PDM and PCM studies. Graphic

design training in designing learning media and training on the use of IT-based learning applications. The strategy of increasing pedagogical competence of teachers in the era of revolution 4.0 at SMP Muhammadiyah Al-Kautsar PK through workshops and seminars related to character strengthening, writing HOTS questions and Ice Breaking. Teachers attend MGMP Muhammadiyah and MGMP Private School in Sukoharjo. Teachers follow academic supervision by the principal, PCM, and the Sukoharjo Education Council. Awarding outstanding teachers once a month, training in tahsin, tajweed and tahfidz for teachers and employees, Islamic studies through teacher studies, PDM and PCM studies. Graphic design training in designing learning media and training Utilization of IT-based learning applications in the form of zoom, google classroom, and Edmodo.

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## Author Contribution

All authors contributed equally to the main contributor to this paper, some are as chairman, member, financier, article translator, and final editor. All authors read and approved the final paper.

## Conflicts of Interest

All authors declare no conflict of interest.

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