



## Development of Islamic Education Management Based on Cyber Pedagogy: Case Study in Vocational High School

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### Abstract

**Keywords:**

Cyber Pedagogy;  
Education  
Management;  
Islamic Education;  
Information and  
Communication  
Technology;  
Online Learning

This study explores cyber pedagogy potential under Islamic education management in vocational schools. This study intends to investigate how the institution supports professional development and mindset enhancement; the implementation of the program; and the way to overcome obstacles in cyber pedagogy. This research adopts a qualitative field research design with a phenomenological approach. Meanwhile, this study was conducted at Muhammadiyah Kajen Vocational School. This research's primary data collection methods were observation, documentation, and in-depth interviews, involving six key informants, including stakeholders and teaching staff. The findings reveal that All aspects of educational systems, such as technology proficiency, mindset, and learning design, should be supported by the program. Meanwhile, four steps can be taken to implement cyber-based learning. The first step involves mapping knowledge and skills to needs. Second, the school needs to evaluate the involved academicians and keep an eye on their performance. Third on the list is developing training based on needs analysis, which is followed by continuous assessment and monitoring program. In the meantime, this program adds to certain issues. SMK Muhammadiyah Kajen is noteworthy for its ability to cultivate a digital mindset through the integration of human resources into a digital setting, resulting in a cutting-edge, inventive, and contemporary learning environment.

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### Abstrak:

**Kata Kunci:**

Cyber Pedagogy;  
Manajemen  
Pendidikan; Pendidikan  
Islam; Teknologi  
Informasi dan  
Komunikasi;

*Penelitian ini mengeksplorasi potensi pedagogi siber dalam manajemen pendidikan Islam di sekolah kejuruan. Penelitian ini bermaksud untuk menyelidiki bagaimana institusi tersebut mendukung pengembangan profesional dan peningkatan pola pikir; pelaksanaan program; dan cara mengatasi hambatan dalam pedagogi siber. Penelitian ini mengadopsi desain penelitian lapangan kualitatif dengan pendekatan fenomenologis. Sedangkan*

*Pembelajaran Online.*

penelitian ini dilakukan di SMK Muhammadiyah Kajen. Metode pengumpulan data primer penelitian ini adalah observasi, dokumentasi, dan wawancara mendalam dengan melibatkan enam informan kunci, termasuk pemangku kepentingan dan staf pengajar. Temuan mengungkapkan bahwa semua aspek sistem pendidikan, seperti kemahiran teknologi, pola pikir, dan desain pembelajaran, harus didukung oleh program ini. Sementara itu, ada empat langkah yang dapat dilakukan untuk menerapkan pembelajaran berbasis siber. Pertama melibatkan pemetaan pengetahuan dan keterampilan dengan kebutuhan. Kedua, sekolah perlu mengevaluasi akademisi yang terlibat dan mengawasi kinerja mereka. Ketiga adalah mengembangkan pelatihan berdasarkan analisis kebutuhan, dan diikuti dengan program penilaian dan pemantauan berkelanjutan. Sementara itu, program ini juga memiliki permasalahan. Namun, SMK Muhammadiyah Kajen dapat mengatasinya dengan menumbuhkan pola pikir digital melalui integrasi sumber daya manusia ke dalam lingkungan digital, sehingga menghasilkan lingkungan belajar yang mutakhir, inventif, dan kontemporer.

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## 1. Introduction

Technology is a tool that is developed in various fields.<sup>1</sup> There have been many innovations in the field of education that utilize information and communication technology. A lot of information systems have been developed in several fields such as educational services, learning processes, human resource management, infrastructure management, financial management, student management, educational marketing, etc.<sup>2</sup> Nowadays, students face an era of technological disruption which is marked by the increasing usage of information and communication technology in various fields of life, including education.<sup>3</sup>

Over the last two years, online-based education, or PJJ (distance learning), has made significant strides.<sup>4</sup> However, this progress has not entirely eradicated certain challenges, particularly in the Indonesian context. Several concerns persist, such as teachers' struggle to craft engaging online learning experiences, limited access to educational materials at home, less conducive learning environments, restricted internet bandwidth, and the necessity of parental involvement in the learning process.<sup>5</sup> Therefore, some innovations are always needed to cover the drawbacks of online-based education.

<sup>1</sup> Imam Makruf, "Pengembangan Mutu Lembaga Pendidikan Islam Di Era Digital; Analisis Problematika, Tantangan, Dan Strategi" (Pidato Pengukuhan Guru Besar dalam Bidang Ilmu Manajemen Pendidikan Islam, UIN Raden Mas Said Surakarta, 2022), 20.

<sup>2</sup> Richardus Eko Indrajit, "The Ecosystem Framework For U-Learning Implementation Through Courseware Development And Management," in *ELECTRONIC AND MOBILE LEARNING International Seminar Proceedings* (International Research Clinic and E&M Learning Seminar in Educational Technology, Jakarta: Universitas Negeri Jakarta, 2016), 248.

<sup>3</sup> Choirun Nisa and Muhammad Khoirurrosyid, "Learning Quality Improvement Management Model for Elementary School Teachers" 07, no. 02 (2023): 625.

<sup>4</sup> Azhar, "Online Learning amid the COVID-19 Pandemic: A Case Study of the State Islamic University of Mataram," *Nadwa: Jurnal Pendidikan Islam* 14, no. 2 (2021): 265-76, <https://doi.org/10.21580/nw.2020.14.2.6639>.

<sup>5</sup> Jessica Jesslyn Cerelia et al., "Learning Loss Akibat Pembelajaran Jarak Jauh Selama Pandemi Covid-19 di Indonesia," in *Seminar Nasional Statistika X* (Departemen Statistika FMIPA Universitas Padjadjaran, 2021), 14, <http://prosiding.statistics.unpad.ac.id>.

Some people argue that the existing cyber pedagogy must be evaluated. Some innovation and development for this must be designed and implemented. Cyber pedagogy can generally be understood as an attempt to develop an emerging pedagogical paradigm that utilizes technology to enhance teaching and learning experiences.<sup>6</sup> Cyber pedagogy can revolutionize Islamic education by integrating technology into the educational process, offering new possibilities for knowledge acquisition, engagement, and personal growth. Hence, it is necessary to repair the existing cyber pedagogy-based education.

Cyber pedagogy presents promising avenues for transformative change, offering new possibilities for engaging learners, promoting critical thinking, and nurturing a generation of well-equipped individuals to thrive in the digital age. By embracing cyber pedagogy within the framework of Islamic education, we can pave the way for enhanced learning experiences, meaningful engagement, and a holistic approach to education that prepares individuals to contribute positively to their communities and the world at large. This well-managed ICT-based pedagogy has been held in one of the Islamic Institutions in Kajen which is a Muhammadiyah based institution.

Muhammadiyah institutions, especially for schools, generally exhibit robust management. Based on preliminary observations, the ICT-based phenomenon can be attributed to several factors within the Muhammadiyah organization. This includes support from the management, dedicated teaching staff, and backing from the entire Muhammadiyah network. Administrators, both at the local and regional levels, consistently make efforts to foster the progress of primary schools in their respective areas. One of Muhammadiyah Institutions which designed ICT-based learning is SMK Muhammadiyah Kajen.

Some research has been conducted about cyber-based learning. Azhar, in his research, stated that there are some problems faced by cyber-pedagogy based education. Those problems can be in the form of students not having laptops, students finding difficulty in accessing telecommunication signals in their hometowns, and some others experiencing power interruptions during online learning.<sup>7</sup> That research was also supported by Ningtyas et al. which stated that this situation mostly faced during covid-19. Thus, online learning is considered a central education issue during the Covid-19 pandemic.<sup>8</sup> At this moment, lecturers use digital technology to become digital leaders in educational institutions. Besides, Bashori found that this method also applied to classical educational institutions such as *pesantren*.<sup>9</sup> Despite the challenges posed by the COVID-19

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<sup>6</sup> Denny Kodrat, "Mindset Shift in Cyber Pedagogy: A Teacher's Strategy upon Learning from Home," *Jurnal Kajian Peradaban Islam* 3, no. 2 (November 30, 2020): 28, <https://doi.org/10.47076/jkpis.v3i2.49>.

<sup>7</sup> Azhar, "Online Learning amid the COVID-19 Pandemic: A Case Study of the State Islamic University of Mataram," 276.

<sup>8</sup> Dian Nuri Ningtyas and Adison Adrianus Sihombing, "Blended Learning: 21st Century Learning As A 'Middle-Way' Maintaining Education Quality In The Era of The Covid-19 Pandemic," *EDUKASI: Jurnal Penelitian Pendidikan Agama dan Keagamaan* 21, no. 1 (April 30, 2023): 60, <https://doi.org/10.32729/edukasi.v21i1.1420>.

<sup>9</sup> Bashori, "Modernisasi Lembaga Pendidikan Pesantren Perspektif Azyumardi Azra," *Nadwa: Jurnal Pendidikan Islam* 11, no. 2 (November 17, 2017): 269–96, <https://doi.org/10.21580/nw.2017.11.2.1881>; Am Saifullah Aldeia et al., "Modernisasi Manajemen Pesantren Menyongsong Era Society 5.0," *EDUKASI: Jurnal Penelitian Pendidikan Agama dan Keagamaan* 21, no. 1 (April 30, 2023): 17–30, <https://doi.org/10.32729/edukasi.v21i1.1287>.

pandemic, educational institutions can use these challenges to utilize information technology for teaching in this recent era (post covid 19).<sup>10</sup>

Previous studies related to cyber pedagogy have tended to address the following four issues. *First*, studies that look at the difficulties of online learning because it requires children to study at home are monotonous and boring.<sup>11</sup> This is different from learning at school through offline classes which gives playmates, a supportive learning atmosphere, and varied activities. *Second*, those studies show the difficulty of online-based learning in terms of inadequate infrastructure and low mastery of technology.<sup>12</sup> *Third*, the research shows that the learning design was not well prepared. It means that some schools found difficulties with it.<sup>13</sup> *Fourth*, a study discusses human resources readiness in the digital era. The development of technology in education and the rapid paradigm changes of the old curriculum into MBKM did have a significant impact, but it had weaknesses in the form of teaching staff who were still stuttering technology.<sup>14</sup>

Based on previous research, this research tried to complete the previous discussion. Therefore, this research aims to explore how SMK Muhammadiyah Kajen facilitates teachers' professionalism and mindset improvement for preparing cyber pedagogy; how the implementation of cyber pedagogy in SMK Muhammadiyah Kajen; and how overcoming education challenges. Those aims offer three novelties about technological solutions, and institutional Preparedness as well as Investigating and overcoming the problems on it.

The author selected a research site affiliated with Muhammadiyah because these institutions generally exhibit robust management. Based on preliminary observations. There are multiple reasons for this phenomenon within the Muhammadiyah organization. This entails backing from the Muhammadiyah network as a whole, as well as assistance from the management and committed faculty. Local and regional administrators continuously work to support the advancement of elementary schools in their respective regions

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<sup>10</sup> Azhar, "Online Learning amid the COVID-19 Pandemic: A Case Study of the State Islamic University of Mataram," 267.

<sup>11</sup> I. Stevanus, M. Gita, and Debor, "The Impact of Online Learning toward the Independence of Primary School Students During the Pandemic in Jakarta, Indonesia," *International Journal of Online and Biomedical Engineering* 18, no. 8 (2022): 23–33, <https://doi.org/10.3991/ijoe.v18i08.31965>; Cerelia et al., "Learning Loss Akibat Pembelajaran Jarak Jauh Selama Pandemi Covid-19 di Indonesia."

<sup>12</sup> F. Mustafa, S. Weda, and T. Masykar, "Correlation Between Student Internet Access and Teachers' Self-Efficacy in Teaching Online Classes," *International Journal of Emerging Technologies in Learning* 17, no. 10 (2022): 99–119, <https://doi.org/10.3991/ijet.v17i10.25819>; Kurnia Muhajarah and Silvia Riskha Fabriar, "Menjaga Mutu Pendidikan Di Tengah Pandemi Covid-19 : Studi Pembelajaran Online Di Universitas Islam Negeri Walisongo Semarang," *JUSTEK: Jurnal Sains Dan Teknologi* 3, no. 1 (2020): 42–49.

<sup>13</sup> Ayu Widayari et al., "Fenomena Learning Loss sebagai Dampak Pendidikan di Masa Pandemi Covid-19," *Best Journal: Biology Education Science & Technology* 5, no. 1 (2022): 6.

<sup>14</sup> Toni Wijaya and Nurul Hidayati Murtafiah, "Implementasi Manajemen Pendidikan Islam Dalam Meningkatkan Kualitas Pembelajaran Di Era Digital" 02, no. 02 (2023); Sunarni and Hari Karyono, "Persepsi Guru Terhadap Implementasi Kurikulum Merdeka Belajar di Sekolah Dasar," *Journal on Education* 5, no. 2 (2023): 1613–20, <https://doi.org/10.31004/joe.v5i2.796>.

## 2. Methods

This type of research is qualitative field research<sup>15</sup> with a phenomenological approach.<sup>16</sup> The research is conducted at Muhammadiyah Kajen Vocational School in Pekalongan Regency. The primary objective of optimizing education management based on cyber-pedagogy is to enhance the quality of Islamic education management to meet the demands of the digital era at Muhammadiyah Kajen Vocational School and identify the influencing factors. The research participants encompass all stakeholders in the school, including the school principals, deputy principals, teachers, and students. Data collection involves methods such as observation, interviews, and documentation. Data analysis adopts an inductive approach, ongoing from data collection through the researcher's conclusion. This analysis comprises four main activities: data collection, data reduction, data presentation, and the drawing of conclusions or verification.<sup>17</sup>

## 3. Result and Discussion

### 3.1 Facilitating Teachers' Professionalism and Mindset Improvement for Preparing Cyber Pedagogy

Technological proficiency and aptitude are essential for the success of technology-based education. Therefore, human resources in the educational field must be prepared as well to face this type of learning. This part is also realized by SMK Muhammadiyah Kajen. They believed that teachers' professionalism had to be improved. This improvement must cover all aspects of education such as teachers' skills in technology, learning systems, and organizations, until changing attitudes and the way of thinking.<sup>18</sup> Adi W. Gunawan claims that the words "mind" and "set" make up the term "mindset." It refers to a belief or a group of beliefs or modes of thought, that impact a person's conduct and demeanor, which ultimately dictates their degree of success in life. Therefore, altering a person's beliefs or sets of beliefs is a prerequisite to altering their mindset.<sup>19</sup>

The issue of changing the curriculum into cyber-pedagogy, in this advanced-technology era, is inevitable. This is also faced by SMK Muhammadiyah Kajen. Rustam Aji, the head of the school, said that SMK Muhammadiyah needs to change the teaching administration, such as lesson plans, syllabi, teaching protocols, and other administrative attributes. Besides, these changes must also be accompanied by shifts in learning approaches, teaching strategies, and the utilization of resources relevant to the cyber-based curriculum. He then emphasized that some programs must be taken into account to support these changes. Therefore, the school tried to facilitate this with some workshops. For the first time, teachers optimized their skills by attending technology-based learning by using AI which can be seen in Figure 2.

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<sup>15</sup> John W Creswell, *Research Design: Qualitative, Quantitative, and Mixex Methods Approaches* (London: Sage Publications, 2014).

<sup>16</sup> Amir Hamzah, *Metodologi Penelitian Fenomenologi: Kajian Filsafat Dan Ilmu Pengetahuan* (Malang: Literasi Nusantara, 2020).

<sup>17</sup> Lexy J. Moleong, *Metodologi Penelitian Kualitatif* (Bandung: Remaja Rosdakarya, 2010).

<sup>18</sup> Kodrat, "Mindset Shift in Cyber Pedagogy," 28.

<sup>19</sup> Ali Musri Semjan Putra and Kardina Engelina Siregar, "Challenges and Opportunities for Madrasah in Improving The Competence of Graduate Students," *Al-Tanzim: Jurnal Manajemen Pendidikan Islam* 07, no. 02 (2023): 499.



Figure 2. Workshop Fundamental Artificial Intelligence

It can be seen in Figure 2 that the workshop was held at school in 2022. In this workshop, teachers and teaching staff were guided by the mentor to optimize technology-based learning. There are limitations and challenges for teachers in altering their teaching practices quickly. Nevertheless, teachers must take the initiative, continue learning, and struggle to improve their technology-based learning skills. Being open-minded and willing to learn must be kept in mind by the teacher. The way to awaken a growth mindset is not easy. External motivation is not enough to motivate teachers to use innovative learning approaches. Rewards and punishments, as the external motivation, can be used to boost teachers and teaching staff's spirit in using technology. Even though this will not be fully effective, at least the supporting factors must be provided as well.

The primary issue facing SMK Muhammadiyah Kajen is the challenge of preparing staff members and teachers from earlier generations to use technology. SMK Muhammadiyah Kajen, however, remembers and has faith that the issue can be resolved. According to Mr Budiono, the Deputy Head of Curriculum, working together with instructors from different generations is the best way to address the issue. He mentioned that during the past few years, staff members and teachers have been thinking about this idea. Over this period, their team has been working hard to create an atmosphere that encourages cooperation between more experienced teachers and their younger colleagues, who are quite skilled with technology. To help with this interaction, they have set up a mentoring program in which junior teachers are essential. Their main goal is to help senior teachers understand and use the newest technology tools, such as digital report cards and e-Lib apps, in an efficient manner. Through this collaborative mentorship strategy, more seasoned educators can immediately benefit from their junior counterparts' technology competence.

Some actions in solving this problem have been taken. According to this, the school facilitated teachers and staff with some workshops. There are almost 13 workshops designed to prepare teachers and staff readiness in using technology-based learning. The workshops held by SMK Muhammadiyah Kajen can be seen in Table 1.

**Table 1. Workshops for Facilitating Teachers and Staff Readiness in Cyber-based Pedagogy**

No	Workshop and Training	Competency Strengthening	Participants
1	IHT (In House Training) Curriculum Development	Pedagogy & Professional	Teacher
2	Islamic studys	Spiritual	Teacher
3	Study of Bina Islam	Spiritual	Teacher
4	Dissemination Classroom Action Research (PTK)	Professional	Teacher
5	E-Library for Education	Digital Mindset & Pedagogy	Teacher
6	Workshop Fundamental Artificial Intelligence	Digital Mindset	Teacher & Student
7	Workshop Fundamental UI/UX	Digital Mindset	Teacher & Student
8	Metaverse & Google Workspace	Digital Mindset	Teacher & Student
9	Digital Marketing	Digital Mindset	Teacher & Student
10	Youtube Digital Content for Education	Digital Mindset & Pedagogy	Teacher
11	Workshop Fundamental Cloud Computing	Digital Mindset	Teacher & Student
12	Workshop Fundamental Internet of Things (IoT)	Digital Mindset	Teacher & Student
13	Collaboration	Professional	Teacher & Student

It can be seen from Table 1 that there were almost 13 workshops held by SMK Muhammadiyah Kajen. There were three types of workshops to facilitate teachers' skills, those are technological knowledge, spiritual knowledge, and technology-based pedagogy. The interesting thing about these workshops, SMK Muhammadiyah Kajen not only designs the pedagogical and technological content but also provides spiritual workshops.

This workshop driver mentality preparation in coping with consciousness problems. The application for school and madrasah teachers in facing the era of globalization is, *first*, teachers must always have initiative; *second*, teachers must be able to serve; *third*, teachers must have clear goals and objectives (navigation); and, finally, they have to be willing and able to work responsibly.

### *3.2 The Implementation of Cyber Pedagogy in SMK Muhammadiyah Kajen*

In this era of technological progress, increasing learning activities has become a necessity. Therefore, the world of education must be aware of this, especially in utilizing information and communication technology in the learning process. However, school principals must also pay attention to learning designs that enhance Islamic values for students' daily lives. Education in the digital era emphasizes wider interaction, especially through information and communication technology. The involvement of this technology allows the use of video tutorials,

internet games, online quizzes, and various forms of interaction during the learning process.

Muhammadiyah Kajen Vocational School tried to implement this for their learning activities. Four steps have been taken into account to optimize and manage the learning design. These steps clearly can be seen in Figure 1.

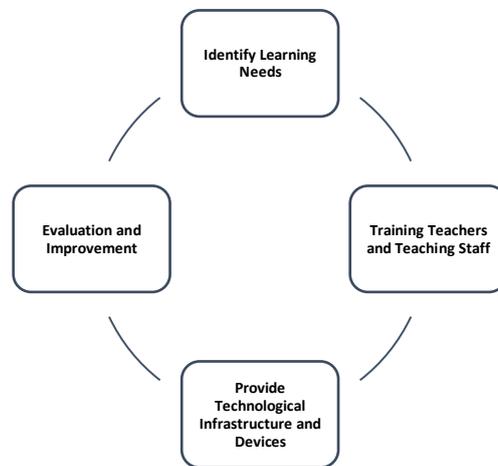


Figure 1. Steps in Management Improvement

In the phase of implementation, SMK Muhammadiyah Kajen implement all the design This allows principals to harness those strengths more effectively, such as assigning teachers with specific skill sets to lead specific trainings or projects. Competency mapping also assists principals in making decisions regarding teacher placement in special classes or programs. Mapping the competence of cyber-pedagogy-based teachers can be done through the following steps:

1) *Teacher Competency Certification Survey*

Conduct surveys or self-assessments for teachers to evaluate their competency levels in technology and cyber pedagogy. Utilize appropriate instruments and adhere to the competency framework that has been established. These surveys can include questions about technology knowledge, usage experience, confidence, and skills in integrating technology into learning.

The implementation at SMK Muhammadiyah Kajen is to conduct surveys and input data on certification and training teachers have participated in. Using a Google Form survey as a tool to map teacher competencies in terms of biodata, experience, and certification of training that has been attended is an idea carried out by the vice principal for staffing.

According to Arie Pamungkas, an officer staff, Google Forms is a user-friendly, web-accessible tool that is well-suited for the modern era of disruption. As educational personnel, we must stay technologically updated to maintain a competitive edge among educational institutions. This platform empowers educators to conveniently complete surveys at their discretion, thus accommodating their availability. Furthermore, Google Forms offers a versatile range of question types, including multiple-choice, short-fill responses, and the ability to upload files via links.

Using Google Forms, survey data can be collected automatically in a structured format. This facilitates the process of collecting and processing

data by responsible parties. Google Forms can also integrate with Google Sheets to easily organize and analyze data.

Google Form surveys can be accessed again in the future if there is a need for periodic updates or mapping competencies. Teachers can fill out a survey with the most recent changes if there is a change in bio, experience, or certification. This makes it easy to maintain up-to-date and accurate data. Google Forms allows responsible parties to view and analyze data quickly and easily. The collected data can be imported into data processing programs such as Google Sheets or Excel to perform further analysis, create reports, or compare competencies between teachers.

Using Google Form surveys to map teacher competencies can be an efficient and practical option. However, it is important to consider the specific needs and context of the school or educational institution to ensure that the mapping method is appropriate for the objectives and needs.

## 2) Performance Observation and Evaluation

Directly observe teacher performance in applying technology and cyber pedagogy in learning. Observe how they use technology, interact with students through online platforms, and manage technology-based learning. This evaluation can involve direct observation, analysis of learning materials, and interaction with students and colleagues.

According to Rustam Aji as the principal, the process of observing and evaluating teacher performance identifies strengths and weaknesses in their teaching methodologies. Through regular observations, school management can provide teachers with constructive feedback, thereby aiding in enhancing teaching quality. This evaluation process encompasses two main types: internal and external audits. Internal audits are conducted annually to uphold the quality of service provided to the community, particularly the students. Each teacher undergoes an audit performed by the school's principal, deputy principal, and head of the study program. External stakeholders, such as the school's principal and their deputy, undergo external audits. An effective audit process is also instrumental in pinpointing areas where teachers may require additional support or training.

By receiving feedback from observers or auditors, teachers can evaluate their learning approach, look for ways to improve interaction with students, and evaluate the effectiveness of their teaching methods. It encourages a process of continuous improvement and professional growth. The auditors and observers discussion can be seen in Figure 3.



Figure 3. Evaluation from External Auditor

Figure 3 shows that the evaluation was held classically. It means that it was held in a group of teachers and staff. It is important to note that observation or evaluation of teacher performance should be fair, objective, and focused on professional development. Constructive and collaborative observation helps create an environment that supports teacher growth and overall improvement in the quality of education.

### 3) Training and Development

Based on the results of competency mapping, identify areas that need improvement and design appropriate training and development programs. The program should provide opportunities for teachers to acquire new skills in using technology in learning. Use an interactive and practical approach, providing real-life case examples and hands-on exercises. Arie Pamungkas, as officer staff confirmed that the training program offers teachers an opportunity to enhance their skills and knowledge in the realm of education. This encompasses refining innovative teaching techniques, integrating technology into learning, adept classroom management, sound judgment, and more. This training aids teachers in maintaining their relevance and staying abreast of the latest advancements in education.

There are several training programs recently implemented at SMK Muhammadiyah Kajen. Training on the use of Digital Marketing, in this case, entrepreneurship subject teachers who play a role in guiding their students to market their products. Many pieces of training are held, including Metaverse training, AI, Website Interface, Youtube Content Creation for learning, and others. So each teacher has a YouTube channel to support learning.

### 4) Continuous Monitoring and Support

After the training, continuously monitor and support teachers in applying technology and cyber pedagogy in learning. Provide mentorship, resources, and collaboration forums to share experiences and challenges faced. Ensure there are opportunities for teachers to continue learning and improve their competence in the use of technology. Rustam Aji confirmed that Support programs additionally offer emotional sustenance to educators. Teachers can exchange their experiences, challenges, and achievements by engaging with supervisors or mentors collaboratively. This

exchange not only diminishes the feelings of isolation but also offers added encouragement to teachers. The emotional backing rendered can also aid in stress management and enhance the overall well-being of educators.

The usage of cyber pedagogy is beneficial in some parts. Laurillard stated that collaboration between pedagogy and technology means developing conventional pedagogy to increase student engagement and activeness that was previously limited. If the teacher ends the learning and provides a summary of the material, students can now take over the role. They can actively contribute to summarizing and attaching links from digital sources, adding rich references.<sup>20</sup>

Therefore, implementing Islamic Education Management to improve the quality of learning in the digital era is becoming increasingly important to create effective, relevant, and following the needs of students and society in the digital era. This part is then taken into account by SMK Muhammadiyah Kajen. However, teachers have to realize that technology is only an aid in learning, and its use must always be adapted to the desired learning objectives and good Islamic values. Therefore, Educational Management for Islamic Institutions must be carefully and continuously evaluated to ensure its effectiveness in improving the quality of learning in the digital era.

The success of technology-based education requires the ability and skills to use technology, have technological pedagogical knowledge and understand the values embedded in the technology of teaching actions. Technology is a positive tool in improving the quality of education, especially in transforming learning traditions c

### 3.3 Exploring the Role of Cyber Pedagogy in Overcoming Education Challenges

Istanto stated that schools under the auspices of the Muhammadiyah organization generally have good management.<sup>21</sup> This also took place at Muhammadiyah Kajen, SMK. Muhammadiyah's strength can be ascribed to several things, including the organization's overall support as well as the backing of the board and faculty. Branch and regional administrators constantly work to support the advancement of local elementary schools. Additionally, educators never stop enhancing the standard of instruction in classrooms. Muhammadiyah members strongly support the development of the school by providing moral, energy, and material support, which is reflected in their participation in school committees or recitation events held by Muhammadiyah.

Cyber pedagogy is emerging as a promising solution in response to the limitations of traditional teaching methods and the need for adaptation in Islamic education. This subsection was used by SMK Muhammadiyah Kajen to examine the role of cyber pedagogy in addressing the educational challenges faced by traditional models:

#### 1) Promoting Active and Interactive Learning

Cyber pedagogy leverages digital technology to create dynamic and interactive learning experiences. Through multimedia resources, online discussions, virtual simulations, and collaborative platforms, students can

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<sup>20</sup> Septi Purfitasari, Titi Prihatin, and Sungkowo Edy Mulyono, "Digital Pedagogy sebagai Pendekatan Pembelajaran di Era Industri 4.0" (Seminar Nasional Pascasarjana, Semarang: UNNES, 2019), 807.

<sup>21</sup> Istanto Istanto et al., "Principal Leadership Model at Muhammadiyah Junior High School of Surakarta City," in *Proceeding ISET (2021) Universitas Negeri Semarang*, vol. 7 (1) (International Conference on Science, Education and Technology, Semarang: Universitas Negeri Semarang, 2021), 778–87.

actively engage with content, encouraging deeper understanding and retention of knowledge. Learning at SMK Muhammadiyah Kajen involves children in a participatory manner, namely, students learn actively, as seen in *ISMUBA* (part of Islamic subjects which consist of Al Islam, Muhammadiyah knowledge, and Arabic language), *duha* prayers, *dhuhur* and *asar* congregational prayers, daughterhood studies, and other worship activities.

Another participatory learning is practicing self-reliance. This learning requires students to serve and cook their food and then promote it as part of entrepreneurship subjects. These activities help students to realize that business or entrepreneurship is important. Related to IT skills, some students took the initiative to create digital Islamic content works such as Youtube, TikTok, and Instagram content.

The description above shows that improving the quality of learning must pay attention to the students' potency, technological disruption, and attitudes that reflect students' soft skills. School principals and superintendents should manage this to improve the learning quality.

2) The communication between Teachers, Schools, and Parents

Technology-enabled learning platforms and online resources overcome the limitations of physical resources. Besides, this makes educational materials and expert knowledge accessible to students regardless of geographical constraints. It broadens the scope of Islamic education, enabling learners to explore diverse perspectives, access digital libraries, and engage with experts and scholars worldwide.

A digital-based attendance system has been developed in the context of SMK Muhammadiyah Kajen. According to Hery Narwanto, a teacher and school IT expert, Educators should engage in more active interaction with parents and the broader community. Through collaborative efforts and active involvement in the realm of education, teachers can gain a comprehensive understanding of students' requirements and establish a conducive learning environment, both within the school premises and beyond. This approach not only promotes the effective oversight of students but also mitigates the likelihood of truancy and academic dishonesty.

Information about student progress can be shared through communication between teachers, schools, and parents by using applications (software). Teachers can provide parents with insight into non-academic aspects, such as students' social, emotional, and personality development. Parents can provide additional input and support to help students develop holistically.

3) Encouraging Global Collaboration and Cultural Exchange

Using technology in cyber pedagogy facilitates collaboration and cultural exchange between students from different regions and backgrounds. Virtual classrooms, video conferences, and online collaboration projects enable students to connect, interact, and learn from peers worldwide, fostering global awareness, understanding, and cross-cultural competence.

According to Rustam Aji, the head of SMK, transitions in government leadership and curriculum alterations can significantly influence teachers, sometimes causing disorientation. However, teachers need to be flexible when faced with these changes, viewing them as chances to improve the quality of their teaching methods. The provision of workshops and professional development programs, whether administered by governmental bodies, educational institutions, or educational organizations, can sharpen teachers' skills in education. These initiatives aid teachers in comprehending the modifications in the curriculum and equip them with pedagogical

strategies aligned with the objectives and context of the new curriculum. Additionally, fostering collaboration among teachers within and beyond their school environments facilitates the exchange of experiences and best practices. By offering mutual support and knowledge sharing, educators can engage in collective learning and, in turn, elevate the overall quality of teaching.

By embracing cyber pedagogy, Islamic educational institutions can leverage technology to overcome the limitations of traditional approaches, enhance the learning experience, and prepare students for the demands of the digital age. The next section will investigate strategies for integrating cyber pedagogy in educational management, highlighting implementation considerations and potential benefits of this innovative approach in Islamic education.

#### 4) Developing ICT-based media

In developing cyber-pedagogy-based by using Islamic education management principles, supervisors can ask teachers to make learning media, such as video recordings of lessons, slide presentations, or online student assignments. This media becomes evidence to show teachers' performance and becomes a focus in analysis and feedback. Besides the material, exam results, assignments, and other assessments clearly show students' understanding of the subject matter. The analysis of this evaluation and assignment will help teachers to identify students' strengths and weaknesses. Moreover, teachers can adjust their teaching strategies to make a more effective and efficient learning process. Teachers have to provide students with more specific and personalized feedback by having accurate and detailed data, helping them reach their maximum learning potential.

Compiling learning resources from the internet and carrying out ongoing assessments will provide understanding systems to assist with learning. This program has been run by SMK Muhammadiyah Kajen for the past three years. Teachers can exchange ideas, teaching philosophies, and supplementary materials by storing and exchanging educational resources digitally. This fosters a cooperative work atmosphere where educators can grow personally and professionally from one another. By gathering and disseminating data and digital artifacts, educators can enhance their student's educational experiences and make a constructive impact on raising the standard of education in general.

Based on that strategy it can be seen that there are four stages followed by SMK Muhammadiyah Kajen in designing cyber-based pedagogy. The illustration of these steps can be seen in Figure 4.



Figure 4. The Design of Cyber-based Pedagogy Management

It can be seen from Figure 4 that there are four steps in designing cyber-based learning taken by SMK Muhammadiyah Kajen. The management design, in the first steps, has been done by designing the model of management which consists of professionalism and mindset improvement, implementation, and overcoming challenges. This research has shed light on several crucial aspects to enhance Islamic education management by effectively integrating cyber pedagogy. *First* and foremost, a significant focus must be placed on management improvement, ensuring that educational institutions are equipped with the tools and strategies to successfully adapt to the digital era. *Secondly*, instilling a digital mindset is imperative, not only among students but also within the teaching staff. Teachers need to embrace technology and integrate it into their pedagogical practices. Beforehand, teachers should be mapped to gather specific needs and competencies, allowing for tailored training and development. *Lastly*, while challenges may arise, they can be overcome with proactive measures and a willingness to adapt to the evolving educational landscape. The road to improving Islamic education management in the digital age is navigable by addressing these key areas.

#### 4 Conclusion

This research concludes that to facilitate teachers and academic staff, the school needs to provide an improvement program. This program should facilitate all aspects of education systems such as technology skills, mindset, and learning design abilities. Meanwhile, there are four steps in implementing cyber-based learning. The first strategy is needs identification which identifies and maps skills and knowledge. Secondly, the school has to observe the performance and do the evaluation. Third of all, designing training based on the identification needs, and the last is doing continuous monitoring and evaluation of the program. Meanwhile, this program, as well as, contributes to some problems. The interesting thing, SMK Muhammadiyah Kajen builds the digital mindset by integrating human resources into the digital environment, creating an innovative, interactive, and up-to-date learning environment. Teachers can use various digital tools and resources to support learning, including online learning platforms, educational applications, and other digital resources. This will enable more engaging, collaborative learning and develop 21<sup>st</sup> century skills for students. Unfortunately,

this research found some drawbacks. Researchers have not implemented a quantitative approach to measure the effectiveness of the program. This shows that some further research must be conducted to complete this research. Therefore, researchers suggest using another research methodology to measure the effectiveness of such a similar program.

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