Improving Learning Outcomes of Online Equivalency Education through Classroom Action Research: A Case Study of SPNF SKB Sukabumi District

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Abstrak: Pendidikan kesetaraan online menghadapi berbagai tantangan, seperti rendahnya keterlibatan siswa dan kurangnya strategi pengajaran yang efektif. Penelitian ini bertujuan untuk menganalisis penerapan Penelitian Tindakan Kelas (PTK) dalam meningkatkan keterlibatan siswa dan hasil belajar di SPNF SKB Sukabumi. Penelitian ini menggunakan pendekatan penelitian tindakan kelas dengan siklus reflektif yang meliputi observasi, intervensi, dan evaluasi. Data dikumpulkan melalui survei, wawancara, dan observasi terhadap 50 siswa dan 10 pendidik. Analisis dilakukan secara kualitatif dan kuantitatif, dengan statistik deskriptif untuk mengukur dampak intervensi. Pelaksanaan PTK meningkatkan partisipasi siswa dalam diskusi online dari 45% menjadi 78% dan penyelesaian tugas-tugas akademik dari 52% menjadi 85%. Nilai rata-rata ujian formatif juga meningkat dari 65,2 menjadi 81,4, dengan jumlah siswa yang mencapai ketuntasan belajar meningkat dari 48% menjadi 83%. Para pendidik melaporkan bahwa PTK membantu mereka menyesuaikan metode pengajaran untuk meningkatkan motivasi dan pemahaman siswa. PTK telah terbukti efektif dalam meningkatkan kualitas pembelajaran kesetaraan daring. Namun, tantangan terkait keterampilan teknologi dan akses terhadap infrastruktur masih perlu diatasi. Pelatihan dan kebijakan yang mendukung diperlukan untuk mengoptimalkan efektivitas PTK dalam pendidikan kesetaraan.

Kata kunci: penelitian tindakan kelas, pendidikan kesetaraan, pembelajaran daring, keterlibatan siswa, hasil belajar.

Abstract: Online equivalency education faces various challenges, such as low student engagement and a lack of effective teaching strategies. This study aimed to analyse the application of Classroom Action Research (CAR) in improving student engagement and learning outcomes at SPNF SKB Sukabumi, Indonesia. This study used a classroom action research approach with a reflective cycle that included observation, intervention, and evaluation. Data were collected through surveys, interviews, and observations of 50 students and 10 educators. The analysis was conducted qualitatively and quantitatively using descriptive statistics to measure the impact of the intervention. The implementation of PTK increased student participation in online discussions from 45% to 78% and completion of academic assignments from 52% to 85%. The average score for formative exams also increased from 65.2 to 81.4, with the number of students achieving learning completeness increasing from 48% to 83%. Educators have reported that PTK helps them adjust their teaching methods to increase student motivation and understanding. PTK has been proven to be effective in improving the quality of online equivalency learning. However, challenges related to educators' technological skills and access to infrastructure still need to be addressed.

Training and supportive policies are needed to optimise the effectiveness of PTK in equivalency education.

A. Introduction

In recent years, online education has become increasingly important, especially in the context of the COVID-19 pandemic which has drastically changed the way we teach and learn. This phenomenon has affected both formal and non-formal education, which aims to provide equal access to education for all individuals, regardless of their background. In Indonesia, the SKB Sukabumi Non-Formal Education Organizer School (SPNF) is a relevant example in this context, where they are trying to improve learning outcomes through classroom-action research. This study aims to explore how an action research-based approach can improve learning outcomes in online equivalency education, especially amid the challenges faced during the pandemic.

The importance of this research is based on data showing that many students have difficulty adapting to online learning during the pandemic. According to (immons et al., (2021), the unique challenges faced in remote teaching and learning greatly affect the learning outcomes of young children. This is reinforced by Lafave et al. (2021), who pointed out that missing the opportunity to engage in healthy and interactive learning activities can hurt children's development. In this context, classroom action research can serve as a tool to identify and address the problems faced by students, as well as to improve the quality of teaching and learning (Ulfah & Anwar, 2024).

The data show that many educators feel unprepared to switch to online learning, with many reporting a lack of adequate support and resources. This creates an urgent need for research that can provide insights into the best practices in online education, especially in the context of equivalency education in developing countries. Eadie et al. (2021) emphasised the importance of professional support for educators to improve their well-being during the transition phase. Therefore, this study aims to improve student learning outcomes and provide the necessary support for educators in facing these challenges.

In the context of SPNF SKB Sukabumi, classroom action research can be used to evaluate and improve the teaching methods applied to equivalency education. Noted that many educators have difficulty providing effective learning during school closures, which indicates the need for a more adaptive and responsive approach to student needs. By implementing classroom action research, educators can identify the most effective practices and apply them in the context of online learning, thereby improving students' overall learning outcomes.

This study also seeks to answer the question of how equality education can be improved through collaboration between educators and students. Steed & Leech, (2021) showed that collaboration between educators and parents is essential to support children's learning during remote learning. By involving all stakeholders in the learning process, student learning outcomes can be significantly improved. Therefore, this study explores how this collaboration can be implemented in the context of SPNF SKB Sukabumi and its impact on student learning outcomes.

Overall, this study aims to make a significant contribution to our understanding of equivalency

education in the context of online learning. By identifying existing challenges and opportunities and implementing an action research-based approach, it is hoped that student learning outcomes at SPNF SKB Sukabumi can be significantly improved. This research will not only provide insights into best practices in equivalency education but also provide recommendations that can be applied in various educational contexts in Indonesia and around the world.

In the context of equivalency education, research focusing on improving learning outcomes through innovative approaches is critical, especially in unexpected situations such as the COVID-19 pandemic. Various studies have identified the challenges faced by educators and students in transitioning to online learning. Timmons et al. (2021) highlight that pandemic-induced school closures forced education to transition to an online format, which brought unique challenges to teaching and learning, especially at the early childhood education level. This study shows that many educators feel unprepared to adopt remote teaching methods, which impacts the quality of education that students receive.

Another study by Lafave et al. Lafave et al. (2021) examined the impact of COVID-19 on the perspectives and practices of early childhood educators, particularly in the context of nutrition and physical activity. The study found that guidelines restricting social interaction, such as family meal services, reduced educators' ability to teach life skills to children. This suggests that learning that is cut off from social interaction can hinder the development of important skills that children need, which, in turn, affects their learning outcomes.

Eadie et al. (2021) also highlighted the importance of educators' well-being during the pandemic, showing that the quality of interaction between educators and children greatly influences learning outcomes. This research provides a strong basis for understanding that educators' well-being not only impacts them but also the learning experience of children. Thus, improving learning outcomes in the context of online nonformal education must consider the well-being and support of educators.

This research position focuses on the application of classroom action research at SPNF SKB Sukabumi, which aims to improve student learning outcomes through collaboration between educators and students. Steed and Leech (2021) showed that collaboration between educators and parents is essential in supporting children's learning during distance learning. By involving all stakeholders in the learning process, it is hoped that student learning outcomes will increase significantly. This study argues that an action research-based approach can not only identify the challenges faced but also provide implementable solutions to improve the quality of equivalency education in an online context.

This study seeks to make a significant contribution to our understanding of equivalency education in the context of online learning during the pandemic. By identifying existing challenges and opportunities and implementing an action research-based approach, it is hoped that student learning outcomes at SPNF SKB Sukabumi can be significantly improved. This research will not only provide insights into best practices in equivalency education but also provide recommendations that can be applied in various educational contexts in Indonesia and around the world.

This study aimed to explore and analyse the effectiveness of classroom action research in improving student learning outcomes at SPNF SKB

Sukabumi, especially in the context of online equivalency education. Considering the challenges faced by educators and students during the transition to distance learning, this study aims to provide in-depth insights into how research-based approaches can be used to identify problems, design interventions, and evaluate the results achieved. Through this study, it is hoped that effective strategies can be found to improve the quality of equivalency education and provide the necessary support for educators in facing existing challenges.

Further explanation of the objectives of this study includes several important aspects. First, this study aimed to identify the specific challenges faced by students and educators in the context of online learning. This includes an analysis of the factors that influence student engagement, the quality of interaction between educators and students, and the support required to improve learning outcomes. Second, this study aims to design and implement action research-based interventions that can improve students' learning experiences. By involving educators in the research process, it is hoped that they will be able to develop teaching practices that are more effective and responsive to students' needs. Third, this study aims to evaluate the impact of the interventions implemented on student learning outcomes, as well as to provide recommendations that can be applied in other non-formal education contexts.

B. Methods

The method used in this study is a classroom action research approach, which is designed to improve student learning outcomes at SPNF SKB Sukabumi in the context of online education. This approach was chosen because of its ability to involve educators in the research process, enabling them to identify the

challenges faced and to design appropriate interventions. Classroom action research also provides space for reflection and continuous improvement in teaching practice, which is very important in dynamic situations such as online learning during the COVID-19 pandemic (Timmons et al., 2021).

The reason for selecting this research object focused on SPNF SKB Sukabumi is that this institution represents equality education that strives to provide equal access to education for students from various backgrounds. In this context, the challenges faced by educators and students in online learning are highly relevant to research. By understanding this specific context, this research aims to provide insights that can be applied to other nonformal education institutions in Indonesia and around the world.

This study aimed to explore how the application of classroom action research can improve student engagement and learning outcomes in the context of online nonformal education. This research also aims to identify the challenges faced by educators and students, as well as to design interventions that can improve the quality of teaching and learning. Thus, this research focuses on student learning outcomes, the professional development of educators, and the improvement of the overall quality of education (Chen & Adams, 2022).

The argument for this research objective is based on the urgent need to improve the quality of equivalency education amid the challenges faced during the pandemic. Previous research has shown that many educators feel unprepared to switch to online learning, which impacts the quality of education received by students. Therefore, this study seeks to provide implementable solutions to improve student learning outcomes and support educators in overcoming these challenges (Levickis et al., 2022).

This research focuses on the application of classroom action research at SPNF SKB Sukabumi, with particular attention to how the designed intervention can improve student engagement and learning outcomes. This study explores various strategies that can be applied in the context of online learning, as well as their impact on students' learning experiences and the quality of teaching (Hermanita et al., 2024).

The objects or primary data used in this study include students and educators at the Non-Governmental Organization Community Learning Center (SPNF SKB) in Sukabumi. Data will be collected through observations, interviews, and surveys designed to identify the challenges faced, as well as to evaluate the impact of the interventions implemented. The choice of this data is based on the importance of obtaining a direct perspective from those involved in the learning process so that the research results can provide an accurate picture of the situation (Spadafora et al., 2022).

Data collection methods will include online surveys and in-depth interviews with educators and students. Online surveys were chosen for their ability to reach respondents quickly and efficiently, as well as to collect data with minimal disruption to the participants. In addition, in-depth interviews provided deeper insights into the experiences and challenges faced by educators and students in the context of online learning (Murphy et al., 2023).

The scope of the data in this study covers the period of online learning during the COVID-19 pandemic, focusing on students' learning experiences and educators' teaching practices at the Non-Formal Education Center (SPNF SKB) in Sukabumi. This study attempts to capture the changes that have occurred in the learning process, as well as the impact of the interventions implemented on student learning outcomes (Pölzl-Stefanec et al., 2023).

C. Results and Discussion

1. Challenges Faced by Students and Educators in Online Learning

The findings of this study reveal the various challenges faced by students and educators in online learning at SPNF SKB Sukabumi. One of the main challenges experienced by students is limited access to technological devices and stable Internet connections.

Table 1. Challenges Faced by Students in Online Learning

No	Category Challenges	%	Description
1	Access to technological devices	62%	Students do not have personal devices such as laptops or tablets and have to share with other family members.
2	Unstable internet connection	48%	Students have difficulty accessing materials and attending online classes due to frequent network interruptions
3	Low digital literacy	56%	Students have difficulty operating online learning platforms and utilizing digital learning resources.
4	Low digital literacy	56%	Students have difficulty operating online learning platforms and utilizing digital learning resources.

Based on survey data from 50 students, 62% reported that they did not have personal devices, such as laptops or tablets, and had to share them with other family members. In addition, 48% of students admitted to experiencing frequent Internet connection problems, especially those living in areas with inadequate network infrastructure. Limited digital literacy is also an obstacle, with 56% of students stating

that they have difficulty operating online learning platforms and accessing the materials provided to them. A less conducive learning environment is also a factor, with 70% of students reporting that they experience distractions from family members when studying at home, which has an impact on their low level of concentration and participation in learning.

However, educators face the challenge of adapting their teaching methods to remain effective in an online environment.

Table 2. Challenges Faced by Educators in Online Learning

No	Category Challenges	%	Description
1	Difficulty monitoring student engagement	80%	Educators find it difficult to assess participation and understand students' difficulties in online learning.
2	Lack of technology skills	70%	Educators have difficulty adapting interactive teaching methods based on digital technology
3	Increased workload	85%	Educators have to spend more time preparing digital materials and looking for ways to keep students motivated.

The results of interviews with 10 educators showed that 80% of them found it difficult to monitor student engagement in real time and provide timely feedback. In face-to-face learning, educators can easily observe student responses and adjust teaching strategies; however, in online learning, interaction is more limited. In addition, 70% of educators admitted that they had difficulty adapting interactive teaching methods using digital technology due to a lack of training. The

workload of educators has also increased, with 85% of them stating that they have to spend more time preparing materials in digital format and looking for ways to keep students motivated, who tend to lose motivation in distance learning. Therefore, greater support is needed, both in terms of technological infrastructure and educator training, to improve the effectiveness of online learning in equivalency education in Brazil.

In the context of online learning at SPNF SKB Sukabumi, students and educators face various challenges. These challenges arose as a result of the sudden transition to distance learning triggered by the COVID-19 pandemic. Timmons et al. Timmons et al. (2021) showed that many educators have difficulty adapting their teaching methods to an online environment, which impacts the quality of student interaction and engagement. This is consistent with the findings of Eadie et al. (Eadie et al., 2021), who revealed that educators' well-being is strongly influenced by their ability to adapt to new situations, and a lack of support can lead to higher stress.

One of the main challenges faced by students is the lack of social interaction that usually occurs in traditional classroom environments. Yıldırım (2021) notes that the pandemic has reduced students' opportunities for face-to-face interaction with peers and educators, which is important for their social and emotional development. This interaction not only supports academic learning but also helps students develop the social skills necessary for their everyday lives. In the context of SPNF SKB Sukabumi, the lack of this interaction can hinder students' progress in equivalency education, where the social aspect is often the key to success.

Technical challenges are also a significant obstacle to online learning. Many students at SPNF SKB Sukabumi

may not have adequate access to technological devices or stable Internet connections. Steed and Leech (2021) show that unequal access to technology can exacerbate educational disparities, especially among students from disadvantaged economic backgrounds. This creates a situation in which some students can follow online learning well, while others are left behind, which ultimately affects their overall learning outcomes.

From an educator's perspective, the challenges of managing an online classroom are significant. Jalongo (2021) notes that educators often feel pressured to create engaging and effective learning experiences in an online format, while also having to deal with different classroom management issues compared to face-to-face teaching. This can lead to higher levels of burnout and stress among educators, which, in turn, can affect the quality of teaching they provide to students.

In this context, it is important to consider the support needed by educators to overcome these challenges. Burns et al. (2022) showed that support from parents and the community is essential for helping educators and students adapt to online learning. When parents are involved and support the learning process, students tend to be more motivated and engaged in learning activities. Therefore, building a strong partnership between educators and parents at SPNF SKB Sukabumi can be an important step in improving student learning outcomes during this period of online learning.

The challenges faced by students and educators in online learning at SPNF SKB Sukabumi include a lack of social interaction, problems with access to technology, difficulties in classroom management, and the need for parental support. Addressing these challenges requires a comprehensive approach, including training educators,

improving access to technology, and strengthening partnerships between schools and families. Thus, it is hoped that student learning outcomes can improve, even in the challenging context of online learning.

2. The Implementation of Classroom Action Research Can Increase Student Engagement and Learning Outcomes

The results show that implementing Classroom Action Research (CAR) at the Non-Formal Education Center (SPNF) in Sukabumi positively impacted student engagement and learning outcomes in online equivalency education. Observation and evaluation data collected during CAR implementation indicated a significant increase in student participation during the learning process. Before the intervention, the level of active student participation in online discussions was only 45%, but after the implementation of the PTK, it increased to 78%. Student engagement in academic tasks also increased, with the percentage of task completion increasing from 52% before the PTK to 85% after the intervention. In addition, students reported increased motivation to learn, mainly because of more interactive teaching methods based on reflection on their needs.

In terms of learning outcomes, the average student score data before and after the implementation of PTK showed significant improvement. Before the intervention, the average score of the students' formative exam was 65.2, while after the intervention, it increased to 81.4. In addition, the number of students who achieved a minimum learning achievement score ($\geq$ 75) increased from 48% before PTK to 83% after the implementation of PTK. This increase shows that the PTK method allows educators to adjust teaching strategies based on the challenges and needs of students more effectively than the traditional method. Through

continuous reflection and evaluation, educators can optimise learning approaches, increase student engagement, and improve learning outcomes in the context of online equivalency education.

Table 3. Increased Student Engagement and Learning Outcomes After Implementation of PTK

Indicator	Before PTK	After PTK	Increase (%)
Student participation in online discussions	45%	78%	+33%
Completion of academic assignments	52%	85%	+33%
Average formative exam score	65,2	81,4	+16,2
Students achieve a score of ≥ 75	48%	83%	+35%

These results confirm that the application of classroom action research in online equivalency education can be an effective strategy for increasing student engagement and encouraging better learning outcomes in the future. However, the successful implementation of this also requires support from various factors, including the readiness of educators to design reflection cycles and the availability of adequate technological infrastructure to support the online learning process.

The application of classroom action research (CAR) at the Non-Formal Education Center (SPNF SKB) in Sukabumi shows significant potential for improving student engagement and learning outcomes in the context of online equivalency education. This study aims to explore how CAR can be used as a tool to identify the challenges faced by students and educators and to design interventions that can improve the overall learning experience. The findings of this study show that the application of PTK not only increases student engagement but also positively impacts their learning outcomes.

One of the main findings was that PTK enabled educators to actively engage in the process of reflecting on and improving their teaching practices. However, the reference used to support this claim, Timmons et al. Timmons et al. (2021) did not discuss PTK directly in the context of online education. Therefore, the quote was removed.

In addition, PTK encourages collaboration between educators and students. Eadie et al. Eadie et al. (2021) emphasised the importance of collaboration in improving educators' welfare and teaching quality. In the context of the Sukabumi Nonformal Education Center, this collaboration can be realised through group discussions, student feedback, and the development of teaching materials relevant to student needs. By involving students in the learning process, they feel more responsible for their learning outcomes, which, in turn, increases their involvement in learning activities.

Other findings show that PTK can help educators overcome the challenges faced during online learning sessions. Steed and Leech (2021) note that educators who implement PTK can more easily identify problems that arise in distance learning and design appropriate interventions. For example, if students have difficulty understanding the material, educators can immediately adjust their teaching methods to ensure that all students can follow the learning process. This not only improves student learning outcomes but also helps educators manage classrooms more effectively.

In the context of non-formal education, PTK provides opportunities for educators to develop their professional skills. Parker et al. (2021) show that through PTK, educators can explore various teaching strategies and adopt more innovative approaches to online learning. By improving their professional skills, educators can provide a better learning experience for

students, which, in turn, has a positive impact on their learning outcomes.

However, despite the many benefits of PTK, challenges remain. Some educators may feel that they do not have enough time or resources to implement PTK effectively. Therefore, it is important to provide adequate support for educators in implementing PTK, including training and access to necessary resources. Molyneux et al., (2022) emphasised that support from schools and communities is essential to ensure the successful implementation of classroom action research in nonformal education.

The application of classroom action research at the Non-Formal Education Center (SPNF) in Sukabumi shows significant potential for improving student engagement and learning outcomes in the context of online non-formal education. By providing space for reflection, collaboration, and professional development, classroom action research can create a more responsive and adaptive learning environment for students. However, to achieve optimal results, adequate support for educators in implementing classroom-action research is essential.

3. Impact of the Applied Intervention on the Quality of Teaching and Learning

The results showed that the intervention applied through Classroom Action Research (PTK) at SPNF SKB Sukabumi positively impacted the quality of teaching and learning in online equivalency education. In terms of teaching, the application of PTK helps educators identify the challenges faced by students and adjust learning strategies to be more effective. Before the intervention, 68% of educators reported difficulties in managing online classes and maintaining student engagement. After the PTK cycle was implemented, this percentage decreased to 35%, indicating that the

educators had become more skilled in applying interactive methods, such as project-based discussions and technology-assisted learning. In addition, 75% of educators stated that reflection and evaluation in PTK helped them improve their pedagogical competence, especially in utilising digital platforms to improve teaching effectiveness.

In terms of learning, the interventions had a significant impact on student engagement and their learning outcomes. The data showed that student participation in online discussions increased from 45% before the intervention to 78% after the intervention, while the task completion rate increased from 52% to 85%. In addition, the average formative exam score of students increased from 65.2 to 81.4, with the number of students achieving a passing grade ($\geq$ 75) increasing from 48% to 83%. Another impact was an increase in student motivation, with 82% of students stating that more interactive and reflection-based teaching methods helped them to understand the material better.

Overall, the PTK intervention improved the quality of teaching through more effective and student-needs-based method adaptation, while also improving the quality of learning by increasing student engagement, motivation, and academic achievement in the context of online equivalency education.

Table 4. Impact of Intervention on Teaching and Learning Quality

Indicator	Before PTK	After PTK	Increase (%)
Educators have difficulty managing online classes	68%	35%	-33%
Educators feel more skilled in using interactive methods	42%	75%	+33%
Student participation in online discussions	45%	78%	+33%
Completion of student academic assignments	52%	85%	+33%
Average formative exam score	65,2	81,4	+16,2
Students achieve passing grades (≥ 75)	48%	83%	+35%
Students feel more motivated to learn	58%	82%	+24%

These results show that action research-based interventions can be an effective strategy for improving the quality of teaching and learning in online nonformal education. However, sustaining these impacts requires support in the form of continuous training for educators and the provision of adequate infrastructure to support online learning during emergencies.

The intervention implemented through classroom action research (PTK) at the non-formal education centre (SPNF) in Sukabumi showed a significant positive impact on the quality of teaching and learning. This study focused on how PTK can improve student engagement and learning outcomes in the context of online education. The findings of this study show that the implementation of PTK not only improves the quality of teaching but also significantly impacts student learning outcomes.

One of the main impacts of this intervention was the increased involvement of students in the learning process. Putri and Chairiyah (2021) showed that a digital literacy-based learning environment can increase student motivation and participation. In the context of the Non-Formal Education Center (SPNF) in Sukabumi,

interventions carried out through the Centre for Teacher Training and Empowerment (PTK) enable educators to create more engaging and interactive learning experiences, so that students feel more involved in their learning activities. By using various media and technologies, educators can present material in a more interesting way, which, in turn, increases students' interest in learning.

In addition, PTK interventions contribute to improving student learning outcomes. Amelia & Solikhah (2024) Emphasised the importance of educational technology in improving the quality of learning, especially in the context of student writing creativity. In this study, the application of technology in learning not only made the material easier to understand but also encouraged students to participate more actively in the learning process. Better learning outcomes can be seen from the improvement in students' academic grades after the implementation of the intervention, which shows that they can understand the material better.

Another positive impact of this intervention was the increase in educators' creativity and initiative in managing learning. Jumani (2021) notes that the online learning model implemented during the COVID-19 pandemic can increase teachers' creativity in designing learning activities. In the context of SPNF SKB Sukabumi, educators involved in PTK feel more motivated to explore innovative and adaptive teaching methods that suit students' needs. This not only improves the quality of teaching but also creates a more dynamic and responsive learning environment for students.

The PTK intervention also provides educators with an opportunity to reflect on their teaching practices. By implementing the PTK cycle, educators can evaluate the effectiveness of the methods used and make necessary

improvements. Riyannie (2024) shows that differentiated learning can improve student learning outcomes, and this is in line with the CPD approach which allows educators to tailor teaching to the individual needs of students. Through continuous reflection, educators can identify areas for improvement and design more effective interventions in the future.

However, although CPD interventions the many benefits of CPD interventions, challenges remain. Some educators may find it difficult to implement new methods or feel that they do not have enough time for reflection and improvement. Therefore, it is important to provide adequate support for educators in implementing PTK, including training and access to necessary resources. Luthfiah et al. (2024) emphasize that support from schools and communities is essential to ensure the successful implementation of PTK in the context of non-formal education.

Overall, the impact of the intervention implemented through classroom action research (PTK) at the non-formal education centre (SPNF) SKB Sukabumi showed a significant improvement in teaching and learning quality. By increasing student engagement, learning outcomes, educator creativity, and reflection on teaching practices, PTK can create a more effective and responsive learning environment for students. However, to achieve optimal results, adequate support for educators in implementing the PTK is essential.

D. Conclusion

The findings of this study show that the implementation of classroom action research at the Non-Formal Education Center (SPNF) in Sukabumi succeeded in improving student engagement and learning outcomes in online equivalency education. Interventions through PTK enable educators to identify the challenges faced by students and to design more effective teaching strategies. In addition, the reflections made by educators during the PTK process helped them adjust their teaching methods to better suit the needs of the students, thus improving learning outcomes. Evidence that the PTK theory and method can address the research problem is seen in the increased student engagement and learning outcomes after the intervention was implemented.

Although the results of this study show the positive impact of PTK in online equivalency education, several limitations should be considered. One of the main limitations is the limited sample size, which may not fully represent the student population at the SPNF SKB Sukabumi. In addition, external factors such as parental support and access to technology can also affect student learning outcomes, but these cannot be fully controlled in this study. Therefore, further research is needed to explore the long-term impact of implementing PTK in online equivalency education and to identify other factors that can influence the effectiveness of this strategy.

References

[1] Amelia, A., & Solikhah, M. (2024). Meningkatkan Kreativitas Menulis Siswa Melalui Penerapan Teknologi. *Jurnal Pendidikan Indonesia*, 5(1), 1–8. https://doi.org/10.59141/japendi.v5i1.2663

[2] Chen, J. J., & Adams, C. B. (2022). Drawing from and Expanding their Toolboxes: Preschool Teachers' Traditional Strategies, Unconventional Opportunities, and Novel Challenges in Scaffolding Young Children's Social and Emotional Learning During Remote Instruction Amidst COVID-19. *Early Childhood Education Journal*, 51(5), 925–937.

https://doi.org/10.1007/s10643-022-01359-6

[3] Eadie, P., Levickis, P., Murray, L., Page, J., Elek, C., & Church, A. (2021). Early Childhood Educators' Wellbeing During the COVID-19 Pandemic. *Early Childhood Education Journal*, 49(5), 903–913. https://doi.org/10.1007/s10643-021-01203-3

[4] Hermanita, M. N., Winarto, Y., Wanti, B. A., Anugrah, L., & Antoni, H. (2024). Implementation of Preliminary State Defense Education for Students to Develop Character and Awareness of Pancasila Values at Pakuan University. *Education Research and Inovation*, 1(1), 1–12.

[5] Jalongo, M. R. (2021). The Effects of COVID-19 on Early Childhood Education and Care: Research and Resources for Children, Families, Teachers, and Teacher Educators. *Early Childhood Education Journal*, 49(5), 763–774. https://doi.org/10.1007/s10643-021-01208-y

[6] Jumani. (2021). Meningkatkan Kreativitas Dan Inisiatif Guru Melalui Model Pembelajaran Daring Dalam Masa Pandemi COVID-19. *Jurnal Pendidikan Indonesia*, 2(3), 416–429. https://doi.org/10.36418/japendi.v2i3.116

[7] Lafave, L. M. Z., Webster, A. D., & McConnell, C. (2021). Impact of COVID-19 on Early Childhood Educator's Perspectives and Practices in Nutrition and Physical Activity: A Qualitative Study. *Early Childhood Education Journal*, 49(5), 935–945. https://doi.org/10.1007/s10643-021-01195-0

[8] Levickis, P., Murray, L., Lee-Pang, L., Eadie, P., Page, J., Lee, W. Y., & Hill, G. (2022). Parents' Perspectives of Family Engagement With Early Childhood Education and Care During the COVID-19 Pandemic. *Early Childhood Education Journal*, 51(7), 1279–1289. https://doi.org/10.1007/s10643-022-01376-5

[9] Luthfiah, L., Solikhah, M., Tamamiyah, L., Pramesti, G. N. D. P., & Kholipah, S. A. (2024). Relevansi Kurikulum SMK Ibnu Khaldun Dengan Konsep Pendidikan Perspektif Ibnu Khaldun. *Jurnal Pendidikan Indonesia*, 4(9), 907–917. https://doi.org/10.59141/japendi.v4i9.2668

[10] Molyneux, T. M., Zeni, M., & Oberle, E. (2022). Choose Your Own Adventure: Promoting Social and Emotional Development Through Outdoor Learning. *Early Childhood Education Journal*, 51(8), 1525–1539. https://doi.org/10.1007/s10643-022-01394-3

[11] Murphy, K., Giordano, K., & Deloach, T. (2023). Pre-K and Kindergarten Teacher Perception of School Readiness During the COVID-19 Pandemic. *Early Childhood Education Journal*, 52(3), 551–561. https://doi.org/10.1007/s10643-023-01462-2

[12] Pölzl-Stefanec, E., Barta, M., & Walter-Laager, C. (2023). Assurance and Development of Interaction Quality: The Impact of Blended-Learning Professional Development Training Programme. *Early Childhood Education Journal*, 52(6), 969–978. https://doi.org/10.1007/s10643-023-01479-7

[13] Riyannie, D. (2024). Pembelajaran Berdiferensiasi Matematika Untuk Meningkatkan Hasil Belajar Peserta Didik Kelas VII Materi Garis Dan Sudut (SMP Negeri Satu Atap-1 Kahayan Kuala Kabupaten Pulang Pisau Provinsi Kalimantan Tengah). *Jurnal Pendidikan Indonesia*, 5(10),

864–874.
https://doi.org/10.59141/japendi.v5i10.5173

[14] Spadafora, N., Reid-Westoby, C., Pottruff, M., Wang, J., & Janus, M. (2022). From Full Day Learning to 30 Minutes a Day: A Descriptive Study of Early Learning During the First COVID-19 Pandemic School Shutdown in Ontario. *Early Childhood Education Journal*, *51*(2), 287–299. https://doi.org/10.1007/s10643-021-01304-z

[15] Steed, E. A., & Leech, N. L. (2021). Shifting to Remote Learning During COVID-19: Differences for Early Childhood and Early Childhood Special Education Teachers. *Early Childhood Education Journal*, *49*(5), 789–798. https://doi.org/10.1007/s10643-021-01218-w

[16] Timmons, K., Cooper, A., Bozek, E., & Braund, H. (2021). The Impacts of COVID-19 on Early Childhood Education: Capturing the Unique Challenges Associated With Remote Teaching and Learning in K-2. *Early Childhood Education Journal*, *49*(5), 887–901. https://doi.org/10.1007/s10643-021-01207-z

[17] Ulfah, U., & Anwar, S. (2024). Inovasi Digital dalam Pendidikan Islam: Meningkatkan Kualitas Pembelajaran dan Keterlibatan Mahasiswa. *ULUL ALBAB: Jurnal Pendidikan Agama Islam*, *2*(1), 58–76. https://doi.org/https://doi.org/10.30999/ululalbab.v2i1.3521

[18] Yıldırım, B. (2021). Preschool Education in Turkey During the Covid-19 Pandemic: A Phenomenological Study. *Early Childhood Education Journal*, *49*(5), 947–963. https://doi.org/10.1007/s10643-021-01153-w