DINAMISIA: Jurnal Pengabdian Kepada Masyarakat Vol. 9, No.4 Agustus 2025, Hal. 1161-1175
DOI: https://doi.org/10.31849/dinamisia.v9i4.23916

Mentoring Development of AI-assisted Ethnoscience-Based Students Worksheet for Independent Learning

Pendampingan Pengembangan LKPD Berbasis Etnosains Berbantuan AI Untuk Mewujudkan Merdeka Belajar

Fransheine Rumtutuly[1]*, Ratnah Kurniati MA[2], John Nandito Lekitoo[3], Lestari[4], Rina Dolewikou[5], Demianus Adrian Dolaitery[6], Hermina Kwuwulay[7], Difia Sairtory[8], Juandi Miru[9]
[1,2,3,4,5,6,7,8,9] Universitas Pattimura, Ambon
E-mail:rumtutulyfransheine21@gmail.com[1],ratnah.kurniati@lecturer.unpatti.ac.id[2],john.lekitoo@lecturer.unpatti.ac.id[3],lestari@lecturer.unpatti.ac.id[4],rinadolewikou@gmail.com[5],demianusadriandolaitery@gmail.com[6], herminakwuwulay@gmail.com[7], difiasairtory@gmail.com[8], juandimiru@gmail.com[9]

Abstract

The mentoring program for the development of AI-assisted ethnoscience-based LKPD at SD Negeri Tiakur aims to enhance teachers' skills in designing LKPD that are relevant to the local culture. This training is motivated by the low utilization of technology in learning in border areas such as the Maluku Barat Daya Regency, as well as the insufficient integration of local culture in the learning process. The methods employed include socialization, training, evaluation, and program sustainability. The evaluation results show an 81% improvement in teachers' skills based on the N-gain test. This program has produced attractive, interactive, and contextual LKPD, blending local cultural elements such as traditional dances, weaving, and the koli tree with modern scientific concepts. The use of technology tools such as Canva and Quizizz has made it easier for teachers to design and evaluate LKPD. This program not only improves the effectiveness of learning but also promotes the preservation of local wisdom and supports the achievement of inclusive, high-quality, and contextual education.

Keywords: *Ethnoscience Integration, AI Learning Tools, Canva, Quizizz.*

Abstrak

Pendampingan pengembangan LKPD berbasis etnosains berbantuan AI di SD Negeri Tiakur bertujuan meningkatkan keterampilan guru dalam merancang LKPD yang relevan dengan budaya lokal. Pelatihan ini dilatarbelakangi oleh rendahnya pemanfaatan teknologi dalam pembelajaran di daerah perbatasan seperti Kabupaten Maluku Barat Daya, serta kurangnya integrasi budaya lokal dalam proses pembelajaran. Metode yang digunakan meliputi sosialisasi, pelatihan, evaluasi, dan keberlanjutan program. Hasil evaluasi menunjukkan peningkatan keterampilan guru sebesar 81% berdasarkan uji N-gain. Program ini menghasilkan LKPD yang menarik, interaktif, dan kontekstual, memadukan elemen budaya lokal seperti tarian tradisional, tenun, dan pohon koli dengan konsep sains modern. Penggunaan teknologi seperti Canva dan Quizizz mempermudah guru dalam mendesain dan mengevaluasi LKPD. Program ini tidak hanya meningkatkan efektivitas pembelajaran, tetapi juga mendorong pelestarian kearifan lokal, serta mendukung tercapainya pendidikan yang inklusif, berkualitas, dan kontekstual..
Kata kunci*: Integrasi Etnosains, Alat Pembelajaran AI, Canva, Quizizz.*

1. INTRODUCTION

The development of technology in the era of the industrial revolution 4.0 has a positive impact on education, such as the use of various learning applications to Artificial Intelligence (AI) that helps teachers and students in classroom learning. The utilization of technology such as AI in learning can improve the efficiency, effectiveness, and quality of the learning process, so that students are able to develop the skills needed to face future challenges. (Alimuddin et al., 2023). However, on the other hand, technological development also has a negative impact on students who live as indigenous people who are thick with cultures that have been inherited by their ancestors (Annisha, 2024).

DOI: https://doi.org/10.31849/dinamisia.v9i4.23916

Various traditional arts, local wisdom, and mutual cooperation values that have been passed down from generation to generation have begun to experience fading in various places (Dewi, Suniasih 2023), including students in Moa sub-district, Southwest Maluku District, Maluku Province who live and study in areas that have the characteristics of small border islands. Various behavioral deviations and the fading of local culture among students occur due to the lack of teaching modules developed by teachers based on local culture or ethnoscience which actually supports the current independent learning curriculum (Handayani et al., 2022, Hartatik & Pratikno 2023, Hasibuan 2022).

Ethnoscience is a learning approach that integrates local knowledge into the contextual learning process. Lidi et al. (2022) emphasize that ethnoscience utilizes local knowledge as a source or object of learning. This underscores the crucial role of presenting learning materials that are relevant to students' lives, as they can more easily grasp abstract concepts through culturally familiar examples. Furthermore, Jufirda et al. (2025) argue that ethnoscience is an educational innovation combining elements of local wisdom with science. This approach not only enriches students' learning experiences but also facilitates a holistic understanding by bridging traditional and scientific knowledge. According to Jumriati & Allo (2024), ethnoscience-based learning fosters students' awareness of rediscovering and integrating local wisdom values into their education. This is especially relevant given the current risk of losing local cultural values amidst globalization. By incorporating local wisdom into the classroom, students not only learn science but also appreciate the importance of preserving their cultural heritage. Additionally, Carolina et al. (2024) highlight that ethnoscience learning has the potential to positively influence community culture by unlocking regional potential. Thus, integrating local culture into education benefits not only students but also acts as a catalyst for regional development. Aligned with ethnoscience-based learning, the *Merdeka Belajar* curriculum provides teachers with the flexibility and opportunity to develop teaching modules using AI integrated with local ethnoscience, tailored to the needs of their students (Hasibuan et.al 2023). However, the fact is that data on the use of technology in the learning process in Maluku Province is ranked in the bottom 4 nationally (Herawati et al., 2016). This means that the use of technology in learning in Moa sub-district, MBD district is also relatively low. One of the factors for the low use of technology in learning is the low level of teacher knowledge and skills to integrate technology in learning (Kasmiyanti et al., 2023).

The integration of AI in education offers various significant benefits. AI can enhance efficiency, personalize learning, and provide effective feedback, thereby addressing the individual needs of students and increasing their motivation and engagement in the learning process (Mambu et al., 2023). AI holds great potential to improve the effectiveness and efficiency of teaching and learning processes through its ability to analyze large amounts of data, offer personalized learning, and automate administrative tasks (Fitri & Dilia, 2024). Additionally, AI can assist teachers in designing more flexible learning strategies, providing faster and more detailed feedback, and reducing administrative burdens that often prevent teachers from focusing more on teaching activities (Tania et al., 2025). However, the use of AI in education also faces various challenges. Hartono (2023) explains the challenges of integrating AI into education in Indonesia, including inadequate technological infrastructure in remote or rural areas, a lack of skilled human resources in AI, the digital divide between urban and rural areas, and concerns about data privacy and ethics in the use of AI. Students living in remote areas or regions with limited internet connectivity face greater access challenges compared to students in urban areas with better connectivity (Subroto et al., 2023;

DOI: https://doi.org/10.31849/dinamisia.v9i4.23916

Apriyenti et al., 2024). Moreover, most teachers, especially those in rural areas, feel inadequately skilled in using AI technology in the learning process (Lestari et al., 2023), particularly in SD Negeri Tiakur, located in a remote region in the Maluku Barat Daya district, Maluku Province, which is based on small border islands. Teachers at SD Negeri Tiakur face challenges in utilizing AI in learning. Despite having a good understanding of digital technology use, they still require further knowledge about the concepts and implementation of AI to optimize its use in the learning process (Patty & Lekatompessy, 2024).

SD Negeri Tiakur is one of the schools located in the Moa District, Maluku Barat Daya (MBD) Regency, Maluku Province. This region is also situated to the south of the Banda Sea and shares a border with the neighboring country, Timor Leste. MBD is classified as a border area according to Presidential Regulation Number 33/2015 regarding the Spatial Planning for Border Regions. Based on an interview with the headmaster of SD Negeri Tiakur, the school's facilities and infrastructure are sufficient to support the use of ICT in classroom learning; however, the teaching process in the classroom does not integrate technology with ethnoscience. This is also supported by human resources at the school, where only 27% of teachers are certified, 3.3% of teachers have a master's degree, and 50% of teachers actively participate in seminars and online training but are not oriented towards ethnoscience and AI LKPDs. More specifically, based on preliminary studies at SD Negeri Tiakur, several problems were obtained including: (a) The school does not yet have Ethnoscience LPD, this is because teachers and schools have limited knowledge related to the concepts and practices of developing ethnoscience-based LKPD, so that schools cannot provide sufficient support for efforts to develop ethnoscience LPD. This is caused by various factors, such as lack of budget, other learning priorities, and lack of understanding of the importance of developing ethnoscience-based LKPDs, (b) Lack of teacher skills in developing AI-assisted ethnoscience-based LKPDs, and (c) Teachers and schools have difficulty in obtaining resources relevant to the concept of ethnoscience so that this hinders teachers in developing AI-assisted ethnoscience-based LPDs. Based on this, it can be assumed that teachers of SD Negeri Tiakur need to be empowered through mentoring the development of ethnoscience-based LKPDs with the help of AI. By combining these two approaches in LKPD, we can create learning that is not only more interesting and interactive, but also more contextual and close to students' daily lives. This is in line with Merdeka Belajar's vision, which emphasizes the importance of learning that is flexible, independent, and relevant to the needs and potential of each individual.

The location of SD Negeri Tiakur is very strategic and is a long-established school. The school's vision is the realization of religious, outstanding, cultured, national character, mastering science and technology and caring for the environment. The school's vision is very much in line with the AI-assisted Ethnoscience-based LKPD development assistance program. The AI used in this program is Canva and Quizizz. Canva is an online graphic design platform that can be used to design visually appealing worksheets. By utilizing this platform, teachers can create creative layouts or use existing layout templates (Kemdikbud, 2023). Meanwhile, Quizizz is used as an evaluation tool (Kholida et al., 2023). This platform allows teachers to create interactive quizzes with attractive displays equipped with sound effects, time limits, and game-like animations. This creates an engaging and interactive learning experience. Meanwhile, ethnoscience in Moa Sub-district is very diverse such as VOC inscriptions in Patti Village, De Haan Fort, Wakarleli traditional house, weaving, lakor goats, Koli Tree, traditional dances, Rere culture.

DOI: https://doi.org/10.31849/dinamisia.v9i4.23916

The assistance in developing ethnoscience-based LKPD supported by AI at SD Negeri Tiakur is a relevant solution to address the challenges faced by teachers, particularly in enhancing their skills in developing ethnoscience-based LKPD with the help of AI. This program aims to explore community knowledge that can serve as a bridge to formal science (Mambu et.al 2023), while also preserving Indonesia's cultural identity and shaping students' character (Mamudah, 2024). The integration of cultural aspects in this learning process aligns with the fourth SDG goal, which is to ensure inclusive and quality education and promote lifelong learning. Furthermore, the use of Artificial Intelligence (AI) supports the ninth SDG goal by encouraging innovation and utilizing technological infrastructure to accelerate the transformation of education. This technology enables the development of more adaptive, interactive, and data-driven teaching materials, thereby opening access to technology-based education for students in 3T regions (underdeveloped, leading, and outermost). This effort is also in line with experts' views, which state that integrating technology into education, especially in underserved areas, can bridge educational gaps and enhance the quality of learning (Nurasmi, 2024).

2. METHOD

The implementation method of this PKM activity includes: 1) socialization, 2) training, 3) evaluation, and 4) program sustainability. These stages are designed to ensure the successful implementation of activities comprehensively. The stages of the activities can be seen in the following diagram.

Figure 1. Stages of PKM Activity Implementation

The following is a breakdown of each stage of the PKM activity:

1. Socialization

   The socialization activities are conducted to enhance teachers' understanding of the development of ethnoscience-based LKPD, the development of ethnoscience-based LKPD using Canva, and the development of ethnoscience-based LKPD using Quizizz. The socialization activities are divided into three sessions, each lasting 45 minutes, starting with a 30-minute presentation by the resource person, followed by a 15-minute question-and-answer session. The socialization activities began with the administration of a pretest to the teachers before the socialization material was provided. The measurement tool used in the pretest is a multiple-choice quiz assisted by Quizizz to identify the

DOI: https://doi.org/10.31849/dinamisia.v9i4.23916

initial understanding level of the teachers regarding the socialization material. At the end of the activity, a posttest was conducted for the teachers to measure their understanding of the material that had been presented. The posttest also used multiple-choice questions assisted by Quizizz to evaluate the teachers' improvement in understanding. In addition, at the end of the socialization activities, the teachers were given a guidebook on using Canva and Quizizz as additional support in developing LKPD.

2. Training
   On the second day, the PKM team conducted offline training on developing ethnoscience-based LKPD with AI assistance, located at SD Negeri Tiakur. The training was conducted so that teachers could directly practice the skills needed to develop ethnoscience-based LKPD with the help of AI. The training on the second day aimed to enhance teachers' competence in developing ethnoscience-based LKPD with AI assistance to realize independent learning. The training activities were divided into three sessions, each lasting 45 minutes. The first session involved training on the development of ethnoscience-based LKPD, the second session on the development of ethnoscience-based LKPD using Canva, and the third session on the development of ethnoscience-based LKPD using Quizizz. The second day's activities began with a pretest using a multiple-choice Quizizz test to assess the teachers' initial abilities related to creating ethnoscience-based LKPD with the help of AI Canva for designing LKPD and AI Quizizz for designing evaluations. The teachers involved in this training were 30 teachers divided into subject groups. The PKM team asked each teacher in the group to create an ethnoscience-based, AI-assisted LKPD for the subjects they teach. After the ethnoscience-based AI-assisted LKPD was designed, the PKM team requested the willingness of several subject teacher groups to present their work. At the end of the training, the team administered a posttest using multiple-choice questions aided by Quizizz to measure the improvement in teachers' understanding and skills after the training. At the end of the training activities, teachers were also asked to submit products in the form of AI-assisted, ethnoscience-based LKPD that had been created during the training program on Google Drive. The meetings conducted over 2 days in face-to-face sessions, both for socialization and training, were followed by intensive mentoring for 1 month. During this mentoring, the PKM team visited SD Negeri Tiakur to observe the simulation of the application of AI-assisted ethnoscience-based LKPD tailored to the teaching module. The observation results will be conveyed to the respective teachers as feedback. This assistance also aims to ensure that all teachers at SD Negeri Tiakur produce Ethnoscience-Based LKPD Assisted by Canva and Quizziz.
3. Evaluation
   The evaluation is provided as feedback for the service team regarding the program that has been implemented. This evaluation is conducted through questionnaires that must be filled out by teachers via Google Form and Quizziz and also through video testimonials. In addition, N-Gain is used to measure teachers' understanding and skills. N-Gain provides an objective measure of the difference between pretest and posttest results. This helps the service team assess the extent to which the implemented program successfully improves teachers' understanding and skills related to the development of ethnoscience-based LKPD assisted by AI. With N-Gain, it can be determined whether the improvement falls into the low, medium, or high category. This information is useful for identifying effective parts of the program and areas that need improvement.
4. Program Sustainability
   This stage is carried out through periodic evaluations and cooperation agreements with partners from the study program where the research team is based. During the program, partners play a role in coordinating the teachers who will participate in the training, preparing the activity location,

DOI: https://doi.org/10.31849/dinamisia.v9i4.23916

providing the necessary facilities and infrastructure, and giving input to the PKM team regarding the materials or content to be presented.

3. RESULTS AND DISCUSSION

Improvement of Teacher Understanding

This PKM activity was carried out offline in Southwest Maluku Regency, Moa District, namely at SD Negeri Tiakur. The activity began with remarks from the Principal Tabita Tiau S.Pd, then continued with the PKM Team Leader Fransheine Rumtutuly M.Pd as well as officially opening PKM activities, as shown in figure 1. In the remarks of the PKM Team leader, it was stated that this activity was motivated by the results of the initial study which obtained the fact that in Southwest Maluku Regency, especially in SD Negeri Tiakur, there was no AI-assisted ethnoscience-based teaching material, so the main purpose of this activity was to increase teachers' understanding and skills in designing AI- assisted ethnoscience-based worksheet.

Figure 2: Opening of Socialization Activities

On the first day, the socialization activities began with a pretest before the presentation of material by the resource person. The pretest was conducted to collect data on the understanding of SD Negeri Tiakur teachers regarding the PKM topic. The following data on the Pretest Results of SD Negeri Tiakur teachers are presented in Figure 2.

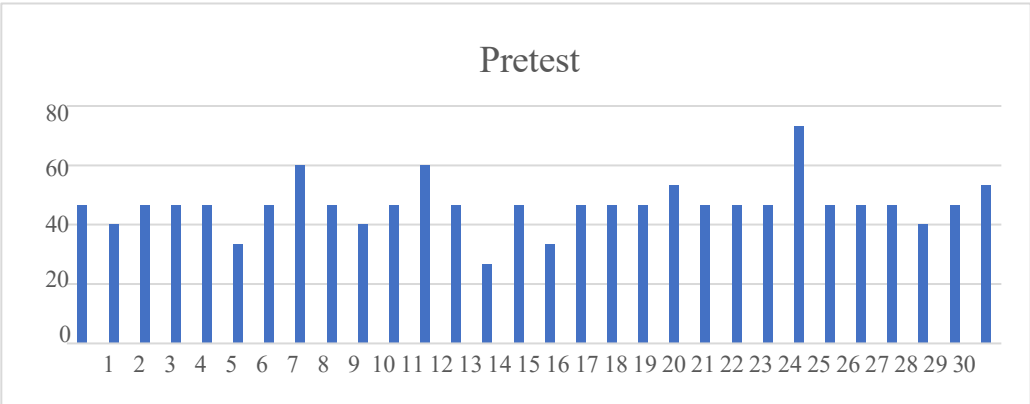

Figure 3: Pretest Results Before assistance

The pretest results of PKM participants in Figure 3 show that most teachers do not have an

DOI: https://doi.org/10.31849/dinamisia.v9i4.23916

adequate understanding of ethnoscience and have not been able to integrate it in the worksheet. This means that teachers have not optimized the environment as a learning resource so that learning is not contextualized (Puspasari et al., 2019). In addition, Junita (2022) explained that the selection of inadequate learning resources can result in low science literacy of students. Therefore, learning materials that support science literacy skills, such as ethnoscience-based worksheets, are needed so that science literacy indicators can be achieved through appropriate learning facilities. By integrating local wisdom into the curriculum, students can better connect with learning materials and understand them in a more relevant context (Nurmahdiyah & Arliani, 2023; Sarwoedi et al., 2018). This research is also useful in introducing cultural heritage to the younger generation, as well as increasing their appreciation of cultural diversity, local wisdom and traditions (Mataheru et al., 2023). Furthermore, Kholidah et al (2023) said that ethnoscience makes local culture and wisdom as learning materials to make the learning process more meaningful.

In the mentoring activities, other information was found, namely that most teachers have not recognized and used AI (*Canva* and *Quizizz*) to design their worksheets. This means that most of the teachers have not utilized AI to present materials that are more interesting and interactive, and increase participant learning motivation (Mamudah et al., 2024). The worksheet made by the teacher is still manual and only consists of questions and answers, so according to Herawati et al (2016) technology convergence-based transformation is needed to optimize the worksheet, both in terms of appearance and learning quality. In line with that, Mambu et al, (2023) argued that the use of AI technology in the teaching process by teachers is very important to improve the quality of education and student learning outcomes.

The essence of this PKM activity is to improve teachers' understanding of the concept of ethnoscience, AI (*Canva* & *Quizizz*) and teachers' skills in developing learning tools based on Ethnoscience assisted by AI. The first speaker in this activity was Fransheine Rumtutuly. The socialization began by explaining the concept of ethnoscience, the concept of worksheets, and the steps of developing ethnoscience-based worksheets, as shown as in figure 3.

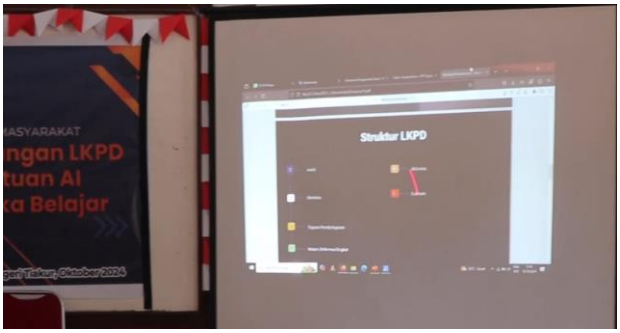

Figure 4: Socialization of Ethnoscience

Fransheine Rumtutuly provided a comprehensive and detailed guide on developing ethnoscience-based worksheets. This guide covered several key aspects, starting with identifying relevant cultural elements. Teachers were taught how to select cultural elements significant to the local community, such as traditional knowledge, local folklore, and indigenous practices, to make learning more contextual and relatable for students. Emphasis was placed on aligning these cultural elements with the existing science curriculum, demonstrating how they can enhance students' understanding and retention of scientific concepts through examples and case studies.

DOI: https://doi.org/10.31849/dinamisia.v9i4.23916

To connect these concepts with the cultural elements of Maluku Barat Daya, specific examples such as Gunung Kerbau and the Kalwedo culture were highlighted. Gunung Kerbau, located on Pulau Moa, is a significant cultural and natural landmark. It is known for its unique landscape, which is dominated by short grasses and minimal tree cover, creating a distinctive appearance that resembles a sleeping buffalo. This mountain is not only a natural wonder but also a symbol of the region's agricultural heritage, particularly in livestock farming. Teachers were encouraged to incorporate the story and significance of Gunung Kerbau into their science lessons, using it as a context to explore geological formations, ecosystems, and the importance of biodiversity.

In addition to Gunung Kerbau and the Kalwedo culture, other cultural elements of Maluku Barat Daya were also integrated into the worksheets. For instance, the traditional woven textiles, known as kain tenun, are a significant part of the local heritage. These textiles, often created using intricate ikat techniques, reflect the rich cultural history and artisanal skills of the community. Teachers used these textiles to teach students about patterns, symmetry, and the cultural significance of traditional crafts, linking these concepts to mathematical and artistic principles (Dahoklory et al., 2023).

Another important cultural element is the lutur batu, or stone walls, found in ancient settlements such as those in Moa Island (Kurniati MA & Lekitoo, 2023). These megalithic structures, made from carefully arranged river stones, serve as historical markers of the region's past. Teachers incorporated the study of these stone walls into lessons on history, archaeology, mathematics, and engineering, helping students understand the construction techniques and cultural importance of these ancient sites. In mathematics, Sugiarto et al. (2024) highlights how the geometric patterns and construction techniques of Lutur Batu embody mathematical principles such as circles, cylinders, comparisons, and statistics. By examining these structures, the study aims to provide a deeper understanding of the local wisdom of the Moa Island community and contribute to the recognition, maintenance, and preservation of cultural heritage with mathematical value.

By incorporating these diverse cultural elements, the worksheets became more engaging and relevant to the students. Teachers found that students were more motivated and interested in the material when it was connected to their own cultural heritage (Pratiwi et al., 2022). This approach not only enhanced students' learning experiences but also helped preserve and promote local traditions and knowledge. Overall, the integration of Maluku Barat Daya's cultural elements into ethnoscience-based worksheets provided a rich, contextual learning experience that bridged traditional knowledge with modern scientific concepts. This method proved effective in making science education more meaningful and accessible to students, fostering a deeper appreciation for both their cultural heritage and the natural world.

Overall, the integration of Maluku Barat Daya's cultural elements into ethnoscience-based worksheets provided a rich, contextual learning experience that bridged traditional knowledge with modern scientific concepts. This method proved effective in making science education more meaningful and accessible to students, fostering a deeper appreciation for both their cultural heritage and the natural world.

DOI: https://doi.org/10.31849/dinamisia.v9i4.23916

Development of AI-based worksheets

In the AI introduction material, teachers are equipped with knowledge related to Canva and Quizizz. The second resource person, Ratnah Kurniati, presented material on the introduction of AI (Canva), how to create a Canva account, and how to use the AI. She began by explaining the basics of Canva, a versatile graphic design tool that can be used to create visually appealing educational materials, as shown as in figure 5. Teachers learned how to set up their Canva accounts, navigate the platform, and utilize its various features to design worksheets, presentations, and other teaching aids. Ratnah emphasized the importance of incorporating local cultural elements into their designs to make the learning materials more engaging and relevant to students.

Figure 5. AI socialization (Canva)

Following the Canva session, John Nandito Lekitoo as the third speaker introduced Quizizz, an interactive quiz platform that leverages AI to enhance student assessments. He demonstrated how to create a Quizizz account, design quizzes, and use the platform's AI features to personalize learning experiences, as shown as in figure 5. Teachers practiced creating quizzes that adapt to students' performance, providing instant feedback and tailored questions to address individual learning needs. This hands-on training helped teachers understand how AI tools like Canva and Quizizz can be integrated into their teaching practices to create a more dynamic and effective learning environment. By the end of the session, teachers felt more confident in using these AI tools to develop culturally relevant and interactive educational materials.

Figure 6. Socialization of AI (*Quizizz*)

At the end of the activity, the PKM Team distributed AI guidebooks (*Canva* and *Quizizz*) in Developing ethnoscience-based worksheets to teachers, so that they could learn before the training

DOI: https://doi.org/10.31849/dinamisia.v9i4.23916

activities on the use of AI in designing ethnoscience-based worksheets were carried out. The training activities on the use of AI (*Canva* and *Quizizz*) in developing ethnoscience-based worksheets began with an introduction to the basics of using the two *platforms*. The participants, consisting of teachers, were divided into small groups based on the subjects they teach, namely IPAS, Mathematics, Indonesian Language, Civics, English. This division aims to facilitate discussion and collaboration in developing worksheets that are in accordance with their respective fields of knowledge and learning contexts. Each group was given the task of designing ethnoscience-based worksheets by utilizing Canva as a tool to design a more attractive worksheets display, and Quizizz as a medium for compiling evaluations in the form of interactive quizzes to measure student understanding. In this process, the teachers discussed how ethnoscience from the surrounding environment can be integrated into their subject matter. In the training on developing ethnoscience-based worksheets with the help of AI, an atmosphere of enthusiasm was evident among the teachers. They were eager to engage in group discussions, exchange ideas, and find the best ways to integrate local wisdom into their subject matter, as shown as in figure 7. For many teachers, this was a new experience, as they had been using store-bought or ready-made worksheets that had not been integrated with ethnoscience. In fact, some teachers who have tried to make their own worksheets have not yet utilized AI technology to present the material in an interesting and interactive way.

Figure 7. Group designing ethnoscience-based NPDs using AI

After the worksheets was designed, each group presented the results in front of other participants, as shown as in figure 8. In this presentation, they explained how ethnoscience concepts were integrated into learning, how to use Canva to beautify the appearance of worksheets, and the use of *Quizizz* to make learning more interactive. Other participants gave feedback, and the discussion went on to improve and refine the results of the worksheets design.

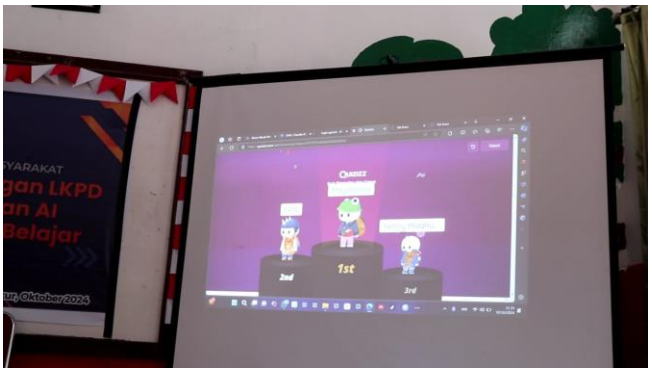

Figure 8. Group Presentation

DOI: https://doi.org/10.31849/dinamisia.v9i4.23916

This activity succeeded in encouraging collaboration between teachers, as well as improving their ability to utilize AI technology to create more interesting and meaningful learning for students. The training activity ended with a *posttest* to determine the impact of PKM on teacher competence. The *posttest* achievement of PKM participants is shown in Figure 8.

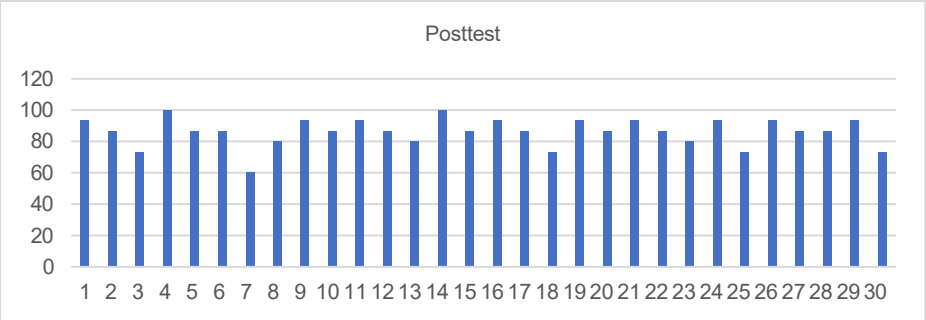

Figure 9. *Post-test* Results

The data in Figure 9 shows an improvement in participants' understanding and skills after participating in the PKM. The results of this PKM also indicated an increase in participants' knowledge of questions 1 to 15 when compared to their initial conditions before the training. However, the participants' ability to design AI-assisted ethnoscience-based worksheets needs *follow up* to continue to develop better. Therefore, after the training activities were completed, the PKM team continued with intensive mentoring for one week to the teachers. This mentoring aims to ensure that the teachers can apply the skills they have learned in designing ethnoscience-based worksheets with the help of AI. For a whole week, the PKM team actively assisted teachers, providing personal guidance and technical advice related to the use of *Canva* for more attractive worksheets designs and *Quizizz* to create interactive quizzes.

In this mentoring session, teachers were given the opportunity to practice making worksheets directly with full support from the PKM team. They helped to identify ethnoscience elements from the local environment that could be integrated into the subject matter and were guided step by step in utilizing the AI features in *Canva* and *Quizizz*.

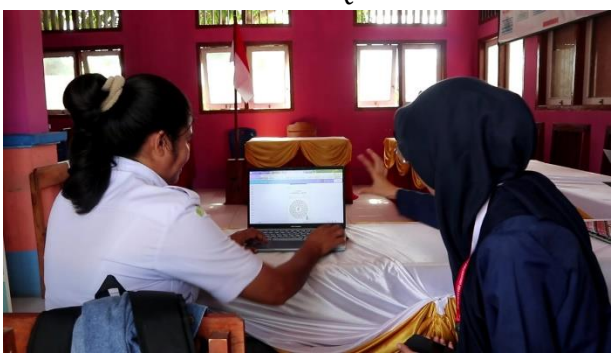

Figure 10. Personalized Teacher Assistance

As the mentoring progressed, teachers' skills in using technology improved. This is evidenced by the results of the N-Gain Test showing a score of 0.81 or equivalent to 81% n-Gain, which is included in the category "high." This assessment refers to the following criteria:
n-Gain is considered "high" if n-Gain > 0.7;
n-Gain is considered "moderate" if it is in the range of 0.3 < n-Gain ≤ 0.7; and

DOI: https://doi.org/10.31849/dinamisia.v9i4.23916

n-Gain is considered "low" if n-Gain ≤ 0.3.

Through this intensive and personalized mentoring, teachers become more confident in designing worksheets that are not only based on local wisdom but also supported by interactive modern technology. At the end of the mentoring, the teachers showed significant improvement in their skills, both in terms of ethnoscience integration and the use of AI to create more interesting and meaningful learning for students.

4. CONCLUSION

The results of the mentoring show that teachers at SD Negeri Tiakur already have an understanding and skills in designing ethnoscience-based worksheets using AI. This mentoring equips them to produce culturally integrated, interesting, interactive, and contextualized worksheets, which are believed to have a positive impact on student achievement. In addition, this activity encourages teachers to utilize technology in teaching, enabling them to create worksheets that are adaptive and responsive to student learning needs, and improve teaching effectiveness. This activity also helps to introduce culture and instill a sense of cultural love among students. With an interesting and interactive design of worksheets using AI, students can understand the relationship between science and local culture while actively engaging in a contextual, fun, and meaningful learning process.

This program has successfully enhanced teachers' skills in integrating AI and ethnoscience into student worksheets (LKPD). Future recommendations include advanced training to further improve the quality of worksheet designs and cross-school collaborations. By continuing to develop these skills, teachers can create even more effective and engaging learning materials that benefit students across different educational settings.

5. ACKNOWLEDGMENT

Appreciation and gratitude are expressed to the Directorate of Research, Community Service, and Community Technology (041/E5/PG.02.00/PM/BATCH.2/202) for providing community service grants. This assistance greatly supports the implementation of activities that are beneficial to improving the quality of education and developing teacher capacity through mentoring the development of AI-based Ethnoscience-based LKPD.

REFERENCES

Alimuddin, A., Juntak, J. N. S., Jusnita, R. A. E., Murniawaty, I., & Wono, H. Y. (2023). Teknologi Dalam Pendidikan: Membantu Siswa Beradaptasi Dengan Revolusi Industri 4.0. *Journal on Education*, *05*(04), 36–38. https://doi.org/https://doi.org/10.31004/joe.v5i4

Annisha, D. (2024). Integrasi Penggunaan Kearifan Lokal (Local Wisdom) dalam Proses Pembelajaran pada Konsep Kurikulum Merdeka Belajar. *Jurnal Basicedu*, *8*(3), 2108–2115. https://doi.org/10.31004/basicedu.v8i3.7706

Apriyenti, Oktawira, L., & Rahmi, S. (2024). Analisis Digitalisasi Pendidikan Terhadap Aksesibilitas, Kualitas dan Inklusivitas Pendidikan. *Indo-MathEdu Intellectuals Journal*, *5*(6), 7426–7436. https://doi.org/10.54373/imeij.v5i6.2097

Carolina, H. S., Liliawati, W., & Sriyati, S. (2024). Kajian Etnosains pada Kuliner Khas Lampung Seruit: Integrasi dengan Konsep Biologi SMA. *Jurnal Biotek*, *12*(1), 1–17. https://doi.org/10.24252/jb.v12i1.47597

Dahoklory, A. S. K., Laurens, T., & Palinussa, A. L. (2023). Development Of Learning Devices Based On Ethnomathematics Of The Meher Tribe Woven Fabrics (Kisar Island) With Realistic Mathematics Education Approach On Number Pattern Material. Jurnal Pendidikan Matematika (JUPITEK), 6(2), 82–92. https://doi.org/10.30598/jupitekvol6iss2pp82-92

Dewi, N. K. A. M. A., & Suniasih, N. W. (2023). E-Modul Ajar Kurikulum Merdeka Belajar Berbasis Kearifan Lokal Bali Pada Mata Pelajaran IPAS Kelas IV. *Jurnal Mimbar PGSD Undiksha*, *11*(1), 91–99. https://doi.org/10.23887/jjpgsd.v11i1.58348

Fitri, W. A., & Dilia, M. H. H. (2024). Optimalisasi Teknologi AI Dalam Meningkatkan Efektivitas Pembelajaran. *Sindoro: Cendekia Pendidikan*, *5*(10), 252–262. https://doi.org/10.9644/sindoro.v3i9.252

Handayani, A. A. A. T., Andayani, Y., & Anwar, A. Y. S. (2022). Pengembangan LKPD IPA SMP Berbasis Etnosains Terintegrasi Culturally Responsive Transformative Teaching (CRTT). *Journal of Classroom Action Research*, *4*(4), 131–135. https://doi.org/10.29303/jcar.v4i4.2396

Hartatik, A., & Pratikno, A. S. (2023). Pudarnya Eksistensi Kesenian Tradisional Ludruk Akibat Globalisasi Budaya. *Jurnal Ilmiah CIVIS*, *XII*(2),56–70. https://doi.org/10.26877/civis.v12i2.10623

Hartono, B. (2024). Teknologi Kecerdasan Buatan dan Pentingnya Beradaptasi dalam Cara Belajar. *Buletin Edukasi Indonesia*, *3*(02), 80–86. https://doi.org/10.56741/bei.v3i02.602

Hasibuan, H. A. (2022). Peran Modul Berbasis Kearifan Lokal Untuk Mendukung Pendidikan Merdeka Belajar. *Journal Mahesa Research*, *1*(1), 292. https://doi.org/10.34007/ppd.v1i1.201

Hasibuan, H. Y., Syarifudin, E., Suherman, & Santosa, C. A. H. F. (2023). Ethnoscience as the Policy Implementation of Kurikulum Merdeka in Science Learning: A Systematic Literature Review. *Jurnal Penelitian Pendidikan IPA*, *9*(8), 366–372. https://doi.org/10.29303/jppipa.v9i8.4500

Herawati, E. P., Gulo, F., & Hartono. (2016). Pengembangan Lembar Kerja Peserta Didik (LKPD) Interaktif untuk Pembelajaran Konsep Mol di Kelas X SMA. *Jurnal Peneltian Pendidikan Kimia*, *3*(2), 168–178. DOI:10.36706/JPPK.V3I2.8163

Jufrida, J., Dani, R., Furqon, M., Kurniawan, W., Riantoni, C., & AJ, S. (2024). Pelatihan Pengembangan Perangkat Pembelajaran Elektronik Terintegrasi Etnosains Menggunakan Heyzine Bagi Guru-Guru Sekolah Menengah Atas Di Kabupaten Batang Hari. *MIMBAR INTEGRITAS : Jurnal Pengabdian*, *4*(1), 28–42. https://doi.org/10.36841/mimbarintegritas.v4i1.5604

Jumriati, & Allo, L. E. (2024). Pengembangan Etnosains dalam Pembelajaran Kimia pada Kurikulum Merdeka: Sebuah Kajian Literatur Development of Ethnoscience in Chemistry Learning in the Merdeka Curriculum: A Literature Review. *Jurnal Ilmiah Pendidikan Kimia*, *5*(1), 150–162. https://doi.org/https://doi.org/10.56630/mes.v3i2.274

Junita, I. W. (2022). The Development of Etnoscience Based e-LKPD to Train Scientific Literacy Skills in Membrane Transport Materials. Berkala Ilmiah Pendidikan Biologi (BioEdu), 11(2), 356–367. https://doi.org/https://doi.org/10.26740/bioedu.v11n2.p356-367

Kasmayanti, N. U., Setyaningrum, V., & Atmaja, D. S. (2023). Pengembangan Bahan Ajar Chatbot Berbasis Artifical Intelligence pada Materi Sistem Pencernaan Manusia Kelas V di Sekolah Dasar. *Edukatif: Jurnal Ilmu Pendidikan*, *5*(1), 294–307. https://doi.org/10.31004/edukatif.v5i1.4694

Kementerian Pendidikan, K. R. dan T. (2023). *Raport Pendidikan Indonesia 2023*. Kementerian Pendidikan, Kebudayaan, Riset, Dan Tekonologi.

Kholidah, L. N., Hidayat, S., Jamaludin, U., & Leksono, S. M. (2023). Kajian Etnosains dalam Pembelajaran IPA untuk Menumbuhkan Nilai Kearifan Lokal dan Karakter Siswa SD Melalui Sate Bandeng (Chanos Chanos). *Pendas: Jurnal Ilmiah Pendidikan Dasar*, *8*(2), 4165–4177. DOI:10.20527/quantum.v10i1.5877

Kurniati MA, R., & Lekitoo, J. N. (2023). Penggunaan GeoGebra dalam Pembuatan Media Pembelajaran Matematika berbasis Etnomatematika Kepulauan (A. Wahdi, Ed.). CV. Dewa Publishing.

Lestari, K. M., Zakir, S., & Gusli, R. A. (2023). Penerapan AI dalam Pembelajaran untuk Meningkatkan Kualitas Pendidikan di SMAN 3 Bukitinggi. *Jurnal Yudistira : Publikasi Riset Ilmu Pendidikan Dan Bahasa*, *2*(1), 277–289. https://doi.org/10.61132/yudistira.v2i1.434

Mambu, J. G. Z., Pitra, D. H., Rizki, A. I. M., Nugroho, W., Leuwol, N. V, & Saputra, A. M. A. (2023). Pemanfaatan Teknologi Artificial Intelligence (AI) Dalam Menghadapi Tantangan Mengajar Guru di Era Digital. *Journal on Education*, *6*(1), 2689–2698. https://doi.org/https://doi.org/10.31004/joe.v6i1.3304

Mamudah, A. H., Fitriyati, D., Putra, F. P., Faridha, G., Faradisa, I., Sinambela, P. N., Wiyandika, R., Engol, S., Setiawati, S., & Wahyuni, S. (2024). Pelatihan Pembuatan e-LKPD Liveworksheets Terintegrasi Canva di SMA Negeri 2 Samarinda. *Jurnal Pengabdian Masyarakat Profesi Guru*, *1*(1), 45–48. https://doi.org/10.30872/jpmpg.v1i1.3595

Mataheru, W., Laurens, T., & Taihuttu, S. M. (2023). The development of geometry learning using traditional dance context assisted by GeoGebra. *Jurnal Elemen*, *9*(1), 65–83. https://doi.org/10.29408/jel.v9i1.6628

Nurazmi. (2024). Pengaruh Penggunaan Teknologi Digital Dalam Pembelajaran Sejarah Terhadap Motivasi Belajar Siswa di SMA Negeri 5 Makassar. *Jurnal Pemikiran Dan Pengembangan Pembelajaran*, *6*(3), 652–658. https://doi.org/https://doi.org/10.31970/pendidikan.v6i3.1489

Nurmahdiyah, F., & Arliani, E. (2023). Analisis Kesalahan Siswa SMA Kelas X Dalam Menyelesaikan Masalah Matematika Berbasis Kontekstual Pada Materi Fungsi Kuadrat. *Jurnal Pedagogi Matematika*, *9*(2), 97–112. https://doi.org/10.21831/jpm.v9i2.19602

Patty, J., & Lekatompessy, J. (2024). Pelatihan Penggunaan Teknologi Artificial Intelligence (AI) Dalam Pembelajaran Bagi Para Guru SD Negeri Tiakur. *Jurnal Pengabdian Masyarakat: Pemberdayaan, Inovasi Dan Perubahan*, *4*(3), 18–24. https://doi.org/10.59818/jpm.v4i3.726

Pratiwi, K. R., Nurmaina, M., & Aridho, F. F. (2022). Penerapan Etnomatematika dalam Pembelajaran Matematika pada Jenjang Sekolah Dasar. Himpunan: Jurnal Ilmiah Mahasiswa Pendidikan Matematika. Himpunan: Jurnal Ilmiah Mahasiswa Pendidikan Matematika, 2(1), 99–105.

Puspasari, A., Susilowati, I., Kurniawati, L., Utami, R. R., Gunawan, I., & Sayekti, I. C. (2019). Implementasi Etnosains dalam Pembelajaran IPA di SD Muhammadiyah Alam Surya Mentari Surakarta. *SEJ: Science Education Journal*, *3*(1), 25–31. https://doi.org/10.21070/sej.v3i1.2426

Sarwoedi, Marinka, D. O., Febriani, P., & Wirne, I. N. (2018). Efektifitas Etnomatematika dalam Meningkatkan Kemampuan Pemahaman Matematika Siswa. Jurnal Pendidikan Matematika Raflesia , 3(2).

Sholahudin, U. (2020). Globalisasi: Antara Peluang dan Ancaman bagi Masyarakat Multikultural Indonesia. *Jurnal Sosiologi Pendidikan Humanis*, *4*(2), 103–114. https://doi.org/10.17977/um021v4i2p103-114

Subroto, D. E., Supriandi, Wirawan, R., & Rukmana, A. Y. (2023). Implementasi Teknologi dalam Pembelajaran di Era Digital: Tantangan dan Peluang bagi Dunia Pendidikan di Indonesia. *Jurnal Pendidikan West Science*, *1*(07), 473–480. https://doi.org/10.58812/jpdws.v1i07.542

Sugiarto, S., Rupilele, K., MA, R. K., Lekitoo, J. N., Inuhan, M., & Dahoklory, A. S. K. (2024). Ethnomathematics Of Small Border Islands: Lutur Batu On Moa Island. BAREKENG: Jurnal Ilmu Matematika Dan Terapan, 18(1), 0475–0482. https://doi.org/10.30598/barekengvol18iss1pp0475-0482

Tania, C., Ardiansyah, F. R., Satya Adifka, M., Irawan, N. S., & Malay, I. (2025). Dampak Penerapan Teknologi dalam Meningkatkan Efektivitas Pembelajaran di Lingkungan Pendidikan Sekolah dan Universitas. *Edu Society: Jurnal Pendidikan, Ilmu Sosial, Dan Pengabdian Kepada Masyarakat*, *5*(1), 14–29. https://doi.org/https://doi.org/10.56832/edu.v5i1.651

Tri Wulandari, & Adam Mudinillah. (2022). Efektivitas Penggunaan Aplikasi Canva sebagai Media Pembelajaran IPA MI/SD. *Jurnal Riset Madrasah Ibtidaiyah (JURMIA)*, *2*(1), 102–118. https://doi.org/10.32665/jurmia.v2i1.245

Wen, M. N. Y., & Aziz, A. A. (2022). The Use of Quizizz as an Online Teaching and Learning Assessment tool in an ESL Classroom: A Systematic Literature Review. *International Journal of Academic Research in Progressive Education and Development*, *11*(1), 1076–1094. https://doi.org/10.6007/ijarped/v11-i1/11929

Winda, R., & Dafit, F. (2021). Analisis Kesulitan Guru dalam Penggunaan Media Pembelajaran Online di Sekolah Dasar. *Jurnal Pedagogi Dan Pembelajaran*, *4*(2), 211. https://doi.org/10.23887/jp2.v4i2.38941