**SEVA International Journal of Community Service in Language, Literature, Culture, and Their Teaching**

Volume 03, Issue 1, July, 2026

# AI-ASSISTED BILINGUAL DIGITAL MEDIA FOR PHYSICAL EDUCATION LEARNING AT MIS NURUL HUDA, CENTRAL BENGKULU REGENCY

E-ISSN : 3089-4980
P-ISSN : 3089-2228
Submitted : May 20, 2026
Accepted : August 22, 2026
Published : August 22, 2026
Page : 51-64
Citation (in APA) : Banat, A., Febrianti, M., Putra, A. R., Martiani, Parado, D. A., & Sari, P. M. (2026). A collaboration of bilingual digital media (Indonesian–English): An innovation in physical education learning using AI applications. *International Journal of Community Service in Language, Literature, Culture, and Their Teaching, 3*(1), 51–64. https://doi.org/10.36841/seva.v2i2.8350
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**Abstract**

This program aimed to improve the competencies of physical education teachers and enhance students' learning motivation through the collaboration of bilingual digital media (Indonesian–English) based on Artificial Intelligence in Physical Education, Sports, and Health (PJOK) learning at MIS Nurul Huda Central Bengkulu. The participants were two physical education teachers and 30 fifth-grade students. The identified problems included limited use of interactive digital learning media, low utilization of AI applications in physical education learning, and the suboptimal use of bilingual sports vocabulary. The implementation methods included observation, socialization, training, mentoring, teaching practice, and program evaluation. The main activities consisted of training on the use of AI applications in PJOK learning, the utilization of interactive digital media, and the implementation of English bilingual sports vocabulary games such as Move and Say, Sport Vocabulary Relay, AI Sport Quiz, and Simon Says Sport Edition. This program assisted teachers in applying simple English sports instructions to make learning engaging and interactive. The results indicated an improvement in teachers' abilities to utilize AI-based digital media and implement simple bilingual learning practices. Students became active, motivated, and confident in using sports vocabulary in English. Furthermore, AI-based educational games successfully created an enjoyable and innovative learning atmosphere.

**Keywords: artificial intelligence, bilingual learning, digital media, English language, physical education learning**

## INTRODUCTION

The rapid development of digital technology in the era of the Industrial Revolution 5.0 has significantly transformed educational practices, including the teaching and learning process in Physical Education, Sports, and Health (PJOK) (Gazali et al., 2026; Ramli et al., 2025). Artificial Intelligence (AI)-based digital media have emerged as innovative instructional tools that enhance learning quality by providing more interactive, engaging, and adaptive learning experiences tailored to students' individual needs (Alam et al., 2026; Rohmah, 2024). In elementary and Islamic elementary schools, AI integration has the potential to support teachers in delivering topics related to fundamental movement skills, sports games, health education, and Indonesian–English bilingual instruction more effectively (Bofill et al., 2025; Kaya, 2025; Yusuf, 2025). Recent systematic reviews confirm that AI applications in physical education can facilitate personalized learning, automated assessment, and performance analytics, thereby improving student engagement and motor-skill development (Webber et al., 2026). Empirical studies in Indonesian elementary schools also demonstrate that AI-enhanced media such as Canva AI significantly increase students' motivation and learning outcomes in PJOK topics like soccer and physical fitness (Ndhanni & Ridwan, 2025). Furthermore, research highlights that while AI strongly supports cognitive aspects of PJOK learning, its contribution to psychomotor skills remains limited and requires pedagogically sound integration with physical activities. International evidence similarly indicates that generative AI and large language models can reduce teachers' lesson-planning time and provide differentiated instructional materials, though challenges such as academic integrity and equitable access must be addressed.

MIS Nurul Huda Central Bengkulu is one of the educational institutions committed to improving educational quality and strengthening students' digital literacy. However, the initial conditions of the partner school indicated that the implementation of technology-supported learning remained limited due to inadequate instructional media, unstable internet access, and teachers' reliance on conventional teaching methods. Preliminary observations and interviews conducted before the implementation of this community service program revealed that only 2 out of 12 teachers (16.7%) had ever utilized digital learning media during classroom instruction, while the remaining 10 teachers (83.3%) continued to rely primarily on textbooks, verbal explanations, and teacher-centered instructional approaches. Furthermore, none of the teachers had previously integrated Artificial Intelligence (AI) applications into the teaching and learning process. The two PJOK teachers specifically reported limited experience in developing interactive digital learning materials and insufficient knowledge regarding the pedagogical use of AI applications to support physical education instruction.

The preliminary assessment also identified several challenges among students. Although most students demonstrated considerable enthusiasm for using digital devices, their technology use was predominantly limited to entertainment rather than educational purposes. In terms of bilingual competence, an initial vocabulary assessment involving 30 fifth-grade students showed that only 5 students (16.7%) were familiar with basic English sports vocabulary, whereas 25 students (83.3%) were unable to recognize or correctly use common sports-related terms and simple instructional commands such as *run*, *jump*, *throw*, and *catch*. During classroom observations, most students also experienced difficulty responding to simple bilingual instructions delivered by the teacher, indicating that the integration of English vocabulary into PJOK learning had not yet been systematically implemented.

According to Arsyad (2019), learning media encompass all instructional tools that facilitate message delivery and stimulate students' attention, thinking, and learning abilities. Smaldino et al. (2018) and Bofill et al (2025) further emphasized that educational technology promotes active, collaborative, and meaningful learning experiences. In physical education, digital technologies facilitate students' understanding of movement through instructional videos, animation, and motion visualization (Laughlin et al., 2019). Moreover, AI has been recognized as a promising technology for personalized education (Gutierrez et al., 2025). Holmes et al. (2022) and Lopez (2025) argued that AI enables teachers to design more adaptive, effective, and efficient learning experiences. Within physical education, AI applications can assist teachers in translating bilingual sports terminology, generating instructional materials, producing learning videos, and supporting simple movement evaluations (Xiaoyu et al., 2025).

Considering these findings, there is a clear need for an intervention that strengthens teachers' digital pedagogical competencies while simultaneously improving students' English sports vocabulary and learning motivation through technology-supported instruction. Therefore, a community service program entitled "AI-Assisted Bilingual Digital Media for Physical Education Learning at MIS Nurul Huda, Central Bengkulu Regency" was implemented. This program was designed to equip teachers with practical skills in utilizing AI-assisted bilingual digital media and to create a more interactive, engaging, and innovative learning environment that supports students' digital literacy and bilingual communication skills in Physical Education.

## PROBLEMS AND SOLUTIONS

This section outlines the primary challenges encountered during the implementation of the community service program, alongside the strategic solutions applied to address them. The following subsections elaborate on the

specific issues faced on-site and the corresponding measures taken to overcome them.

Table 1. Mapping of problems, proposed solutions, and expected outputs

| Identified Problems | Proposed Solutions | Expected Outputs |
|---|---|---|
| Physical education teachers' experience in utilizing AI-based digital learning media and interactive instructional technologies. | Training on the use of AI applications for Physical Education (PJOK), including ChatGPT, Canva AI, and AI-assisted educational tools. | Teachers are able to independently utilize AI applications to design and implement interactive learning media. |
| PJOK learning was predominantly conducted using conventional teaching methods with minimal instructional variation. | Mentoring and classroom simulations using AI-assisted bilingual digital learning media. | More innovative, interactive, and student-centered PJOK learning practices are implemented. |
| Teachers had limited knowledge of AI applications for sports education and instructional media development. | Hands-on workshops on developing AI-assisted instructional materials, digital worksheets, quizzes, and learning videos. | Teachers improve their digital pedagogical competence and confidence in integrating AI into classroom instruction. |
| Students primarily used digital technology for entertainment rather than educational purposes. | Introduction of AI-based educational applications and guiding students in using digital technology as a learning resource. | Students develop positive digital literacy and utilize technology for educational purposes. |
| Students' mastery of Indonesian–English sports vocabulary was relatively low. | Bilingual learning activities through interactive games such as *Move and Say*, *Sport Vocabulary Relay*, *AI Sport Quiz*, and *Simon Says Sport Edition*. | Students demonstrate improved understanding and use of basic English sports vocabulary during PJOK learning. |
| Interactive learning media capable of increasing students' engagement and learning motivation were unavailable. | Development and implementation of AI-assisted bilingual digital media incorporating videos, animations, quizzes, and educational games. | Students become more motivated, actively engaged, and confident during learning activities. |
| The school had never organized training related to AI integration in Physical Education learning. | Comprehensive training, mentoring, program evaluation, and preparation of a practical module on AI utilization in PJOK learning. | Teachers obtain practical guidance through an AI implementation module, ensuring the sustainability of technology-supported learning practices. |

**Expected Overall Program Outcomes**

The implementation of this community service program is expected to strengthen teachers' competencies in integrating Artificial Intelligence into Physical Education instruction, increase students' motivation and engagement through interactive bilingual digital media, improve students' mastery of English sports vocabulary, and establish sustainable AI-supported learning practices at MIS Nurul Huda Central Bengkulu.

## METHOD

The community service program involved two Physical Education, Sports, and Health (PJOK) teachers and 30 fifth-grade students at MIS Nurul Huda Central Bengkulu. The program was conducted from May 6 to May 13, 2026, at MIS Nurul Huda Central Bengkulu, located on Jalan Lintas Lubuk Sini–Ujan Mas, Pungguk Ketupak Village, Merigi Kelindang District, Central Bengkulu Regency.

**Program Design**

This program adopted a participatory training and mentoring approach, consisting of five sequential stages: preparation, socialization, training, mentoring, and evaluation. The activities focused on enhancing teachers' competencies in integrating Artificial Intelligence (AI)-assisted bilingual digital media into Physical Education learning while simultaneously improving students' motivation and mastery of English sports vocabulary.

**Data Collection Instruments**

To evaluate the effectiveness of the program, several instruments were employed.

1. Observation Sheet. Observation sheets were used during the preliminary survey and throughout the implementation to document the initial conditions of the partner school and monitor the learning process. The observations focused on teachers' utilization of digital learning media, classroom learning practices, students' participation, and the implementation of bilingual learning activities.
2. Teacher Competency Questionnaire (Pretest–Posttest). A structured competency questionnaire was administered to the two PJOK teachers before and after the training to measure improvements in their competencies in utilizing AI-assisted digital learning media. The questionnaire assessed teachers' understanding of AI applications, ability to develop digital instructional media, confidence in integrating AI into PJOK learning, and readiness to implement bilingual learning strategies.
3. Students' Learning Motivation Questionnaire. Students' learning motivation was

measured using a Likert-scale questionnaire administered before and after the implementation of the bilingual AI-assisted learning activities. The questionnaire evaluated students' interest in learning, classroom engagement, enthusiasm for participating in bilingual games, confidence in learning activities, and willingness to use digital technology for educational purposes.

4. English Sports Vocabulary Test (Pretest–Posttest). To assess students' mastery of bilingual sports vocabulary, a pretest and posttest consisting of basic English sports terms and simple instructional commands (e.g., *run, jump, throw, catch,* and *kick*) were administered before and after the program.
5. Participant Satisfaction Questionnaire. At the end of the program, teachers and students completed a satisfaction questionnaire to evaluate the quality of the training, mentoring process, learning media, and overall implementation of the community service program.
6. Semi-Structured Interviews

   Semi-structured interviews with the two PJOK teachers were conducted after the program to obtain qualitative feedback regarding the usefulness of AI-assisted bilingual learning media, challenges encountered during implementation, and opportunities for sustaining the program.

**Data Analysis**

Quantitative data obtained from the teacher competency questionnaire, students' learning motivation questionnaire, English sports vocabulary pretest–posttest, and participant satisfaction questionnaire were analyzed using descriptive statistics by calculating mean scores, percentages, and percentage improvements between the pretest and posttest results. Qualitative data collected through observations and interviews were analyzed descriptively through data reduction, categorization, interpretation, and conclusion drawing to support the quantitative findings.

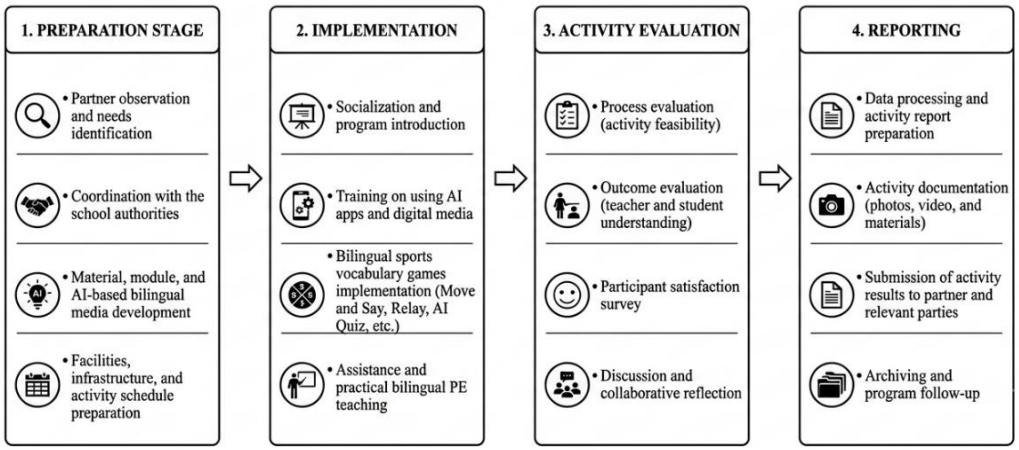


Figure 1. The flowchart of the activities

**Implementation Stages**

The implementation process began with the preparation stage, where the team conducted preliminary observations, identified partners' specific needs, prepared the necessary training materials, and coordinated directly with the school. This was followed by the socialization stage, during which the team delivered detailed explanations on the importance of integrating digital media and Artificial Intelligence (AI) applications into physical education learning. During the training stage, teachers and students received hands-on instruction covering AI learning applications, sports video media, bilingual sports translators, and the development of digital PJOK materials. To ensure smooth application, the team moved into the mentoring stage, actively assisting teachers as they practiced using AI media throughout their PJOK learning activities. Finally, the project concluded with the evaluation stage, where the overall impact and performance were assessed through structured observations, interviews, and participant satisfaction questionnaires.

**Implementation of English Bilingual Sports Vocabulary Games**

In this community service activity, the implementation team introduced an innovative program in the form of bilingual English sports vocabulary games integrated into Physical Education, Sports, and Health (PJOK) learning. This program was designed to help physical education teachers integrate simple English usage into sports activities, making learning more engaging, active, communicative, and enjoyable for elementary school students. The bilingual game activities involved 30 fifth-grade students at MIS Nurul Huda Central Bengkulu under the direct guidance of physical education teachers and lecturers, and students from the Physical Education Study Program of FKIP UNIVED Bengkulu.

According to Cameron (2018), foreign language learning among elementary school children becomes more effective when conducted through play and active movement. Furthermore, bilingual learning based on physical activity can improve memory retention, learning motivation, and students' confidence in using new vocabulary. In the context of sports learning, direct use of English terminology during movement activities helps students understand vocabulary through real experiences. The objectives of these bilingual sports games were:

a. to improve students' mastery of sports vocabulary in English;
b. to assist teachers in implementing sports instructions using simple English;
c. to make PJOK learning more innovative and interactive;
d. to increase students' learning motivation through educational games;
e. to develop students' confidence in communicating in English; and
f. to integrate AI technology with bilingual sports activities.

**Forms of Bilingual Sports Vocabulary Games**

**a. *Move and Say***

The Move and Say activity is designed to train students to understand and practice sports movement vocabulary in English. During the game, the teacher delivers spoken movement instructions in English, which the students then perform accordingly. Common instructional commands used in this practice include "Run!", "Jump!", "Walk slowly!", "Throw the ball!", "Catch the ball!", and "Kick the ball!".

Teachers can combine instructions with AI voice applications or animated movement videos so students can observe the movements while listening to correct English pronunciation. Implementing this activity yields several notable benefits, as it improves students' listening skills and enhances their concentration throughout the lesson. Furthermore, it expands their sports vocabulary mastery while creating a noticeably more active learning atmosphere.

**b. *Sport Vocabulary Relay***

The Sport Vocabulary Relay activity aims to introduce bilingual sports vocabulary through engaging group relay games. To play, students are divided into groups, and English sports vocabulary cards are placed at the far end of the field. The first student in line runs to retrieve a card, returns to their group, and states the Indonesian meaning of the English word; correct answers earn points for the team. Key vocabulary practiced in this game includes pairs such as running (*berlari*), jumping (*melompat*), dribbling (*menggiring bola*), passing (*mengoper*), throwing (*melempar*), swimming (*berenang*), goalkeeper (*penjaga gawang*), and basketball (*bola basket*). Teachers used an AI translator or text-to-speech applications so students could hear the correct pronunciation. This activity offers significant benefits by increasing students' sports vocabulary mastery and training their teamwork skills through collaborative engagement. Additionally, it helps students understand correct English pronunciation and effectively encourages a positive competitive spirit in the classroom.

**c. *AI Sport Quiz***

This activity aims to train students to recognize bilingual sports terminology through AI-based interactive quizzes. In terms of gameplay, teachers utilize AI applications or interactive digital media to display sports images, and students are subsequently prompted to answer the names of the movements or sports in English. For instance, when shown a picture of a student kicking a ball alongside the prompt “What is this?”, students answer “Kick the ball,” or when shown a picture of a basketball alongside “What sport is this?”, they respond with “Basketball.” To facilitate this setup, the activity may utilize AI educational applications, projectors, interactive videos, digital quiz games, and voice-based learning applications. This activity yields several key benefits by increasing learning motivation and supporting both visual and audio learning styles. Furthermore, it makes the

classroom experience more modern while effectively enhancing students' speaking confidence.

**d. *Simon Says Sport Edition***

The Simon Says Sport Edition activity aims to train students' understanding of sports instructions in English. To play, the teacher delivers various action commands such as “Simon says run!”, “Simon says jump!”, “Simon says clap!”, or “Simon says touch the ball!”. However, students must only perform the specified movement if the prompt begins with the phrase “Simon says”—if the teacher omits it, students must remain still. This activity offers several key educational benefits, as it effectively trains students' focus while improving their English listening skills. Additionally, it enhances movement reflexes and creates enjoyable, engaging learning experiences in the classroom.

## RESULTS AND DISCUSSION

### Results

The community service program entitled *“Collaboration of Bilingual Digital Media (Indonesian–English): An Innovation in Physical Education Learning Using AI Applications for Students of MIS Nurul Huda Central Bengkulu”* was implemented systematically according to the planned activities. The program involved lecturers, university students, physical education teachers, and fifth-grade students.


Figure 2. Documentation of PKM team, the principal, teacher, and administrative staff of MIS Nurul Huda


Figure 3. Documentation of the bilingual game activities involving students and PKM's team at MIS Nurul Huda

Figure 4. Last session of activity, documentation with the Fifth-Grade Students of MIS Nurul Huda

The results demonstrated that AI-based digital media successfully increased students' participation and engagement during PJOK learning. Students became more active, motivated, and confident in using simple English sports vocabulary. Teachers also improved their ability to use digital learning media and integrate bilingual instructions into sports learning activities. Questionnaire evaluation results indicated that most students considered PJOK learning using digital media and bilingual games more enjoyable than conventional methods. Teachers stated that AI-based digital media helped them explain sports movements more clearly and attractively.

The program produced several key outputs, including improved teacher competencies in AI-based digital media and enhanced student mastery of bilingual sports vocabulary. Furthermore, it generated a simple bilingual physical education (PJOK) learning module, comprehensive activity documentation, and a notable increase in overall student learning motivation. Overall, the activity ran successfully and received positive support from the school.

**Discussion**

The implementation of this community service program demonstrated that AI-assisted bilingual digital media can effectively improve the quality of Physical Education, Sports, and Health (PJOK) learning at the elementary school level. The baseline assessment conducted before the intervention revealed several limitations in both teachers' instructional practices and students' bilingual competencies. Of the 12 teachers at MIS Nurul Huda Central Bengkulu, only 2 teachers (16.7%) had previously used digital learning media, while the remaining 83.3% still relied on conventional teaching methods. Furthermore, none of the PJOK teachers had prior experience integrating Artificial Intelligence (AI) applications into classroom instruction. Among the 30 fifth-grade students, only 5 students (16.7%) were familiar with basic English sports vocabulary, indicating that bilingual learning had not yet been systematically implemented.

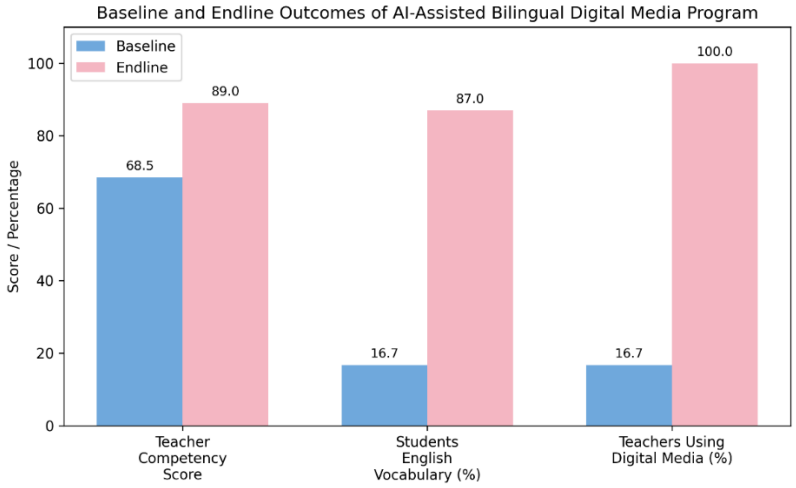


Figure 5. Comparison of baseline and endline results of the community service program

Following the training and mentoring activities, substantial improvements were observed. The average teacher competency score increased from 68.5 before the intervention to 89.0 after the program, indicating a marked improvement in teachers' ability to utilize AI-assisted digital media and bilingual instructional

strategies. Teachers became more confident in designing interactive learning materials, integrating AI applications into PJOK lessons, and applying simple English sports instructions during classroom activities. These findings demonstrate that structured training combined with classroom mentoring effectively strengthened teachers' digital pedagogical competence.

The program also produced positive outcomes for students. Evaluation results showed that 87% of students demonstrated increased learning motivation after participating in AI-assisted bilingual learning activities. Students showed greater enthusiasm for participating in learning, actively engaged in digital sports games, and responded positively to interactive learning media. Classroom observations further indicated that students became more willing to participate in discussions and physical activities when AI-based multimedia and bilingual games were incorporated into the lessons. Regarding bilingual competence, the initial observation found that only 16.7% of students were familiar with basic English sports vocabulary. After participating in activities such as *Move and Say*, *Sport Vocabulary Relay*, *AI Sport Quiz*, and *Simon Says Sport Edition*, 13% of students actively used English sports vocabulary during bilingual learning activities, while the majority showed increased confidence in understanding and responding to simple English instructions. Although vocabulary mastery still requires continuous reinforcement, the program successfully introduced bilingual communication into Physical Education learning in an enjoyable and meaningful manner.

These findings support Mayer's (2021) Cognitive Theory of Multimedia Learning, which states that combining visual, auditory, and interactive learning experiences enhances students' understanding and engagement. The integration of AI-assisted videos, digital quizzes, voice applications, and bilingual games created a learning environment that encouraged active participation rather than passive reception of information. The results also corroborate Cameron's (2018) view that young learners acquire foreign language vocabulary more effectively through games and movement-based activities. By integrating English vocabulary into authentic sports activities, students learned new terminology through direct physical experience, making vocabulary acquisition more meaningful and memorable. This approach aligns with the principles of Content and Language Integrated Learning (CLIL), where language learning occurs naturally while students engage in subject-specific activities.

Overall, the program demonstrated measurable educational impacts on both teachers and students. Teachers improved their competencies in AI-assisted digital instruction, while students showed higher motivation, greater classroom participation, and increased confidence in bilingual sports learning. These outcomes indicate that the collaboration of AI-assisted bilingual digital media represents an innovative and practical strategy for improving Physical Education learning in

elementary schools, particularly in educational settings where technology integration has previously been limited.

## CONCLUSIONS

This community service program demonstrated that the integration of AI-assisted bilingual digital media effectively addressed the challenges faced by MIS Nurul Huda Central Bengkulu in Physical Education, Sports, and Health (PJOK) learning. To overcome these challenges, the program employed a participatory approach consisting of observation, socialization, training, mentoring, teaching practice, and evaluation, focusing on the use of AI applications and bilingual digital media through interactive sports vocabulary games.

These results of the program implementation confirm that AI-assisted bilingual digital media provide an innovative, engaging, and sustainable approach to enhancing teachers' digital pedagogical competencies while simultaneously improving students' motivation, participation, and bilingual communication skills in Physical Education learning. Therefore, this program has the potential to serve as a practical model for integrating Artificial Intelligence into elementary school Physical Education and may be adapted for broader implementation in schools with similar educational contexts.

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