

Designing Multimodal Literacy Instruction Based on the TPACK Model for Teachers at SD Negeri 149 Palembang

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ABSTRACT

Strong literacy skills have a significant impact on the mastery of other areas, including numeracy. Although numeracy itself does not directly contribute to the core definition of multimodal literacy, numerical concepts can be taught using a multimodal approach through the use of visual, audio, and kinesthetic modes. Thus, multimodal literacy not only supports the development of language competencies, but can also enrich cross-disciplinary learning strategies. For multimodal learning to be implemented optimally, teachers need to master TPACK, which enables them to design meaningful learning experiences by effectively utilizing technology. This community service activity aims at providing solutions to these problems through training and mentoring for teachers as SD Negeri 149 Palembang in designing and implementing TPACK-based multimodal literacy, the basic principles of TPACK, and practical applications in developing lesson plans that integrate technology and multimodality. This activity was conducted from October 2025 to November 2025, at SD Negeri 149 Palembang, attended by 23 teachers. The implementation methods included four stages, namely identification of teachers' needs and potential through observations and interviews; presentation on the theory and practice of multimodal literacy and TPACK; workshop on designing TPACK-based and multimodal learning; and the implementation and evaluation of classroom activities. Supported by simple technology applications, such as Canva and other interactive applications, the activity resulted on the knowledge about how to meaningfully integrate technology with pedagogical approaches and content to create rich and engaging learning experiences for students. The use of Topworksheets was one alternative to choose.

Keywords: application, literacy, multimodality, numeracy, TPACK

ABSTRAK

Keterampilan literasi yang kuat memiliki dampak signifikan terhadap penguasaan bidang lain, termasuk numerasi. Meskipun numerasi sendiri tidak secara langsung berkontribusi pada definisi inti literasi multimodal, konsep numerik dapat diajarkan menggunakan pendekatan multimodal melalui penggunaan mode visual, audio, dan kinestetik. Oleh karena itu, literasi multimodal tidak hanya mendukung pengembangan kompetensi bahasa, tetapi juga dapat memperkaya strategi pembelajaran lintas disiplin. Untuk menerapkan pembelajaran multimodal secara optimal, guru perlu menguasai TPACK, yang memungkinkan mereka merancang pengalaman belajar yang bermakna dengan memanfaatkan teknologi secara efektif. Kegiatan layanan masyarakat ini bertujuan untuk memberikan solusi atas masalah tersebut melalui pelatihan dan pembimbingan bagi guru di SD Negeri 149 Palembang dalam merancang dan menerapkan literasi multimodal berbasis TPACK, prinsip dasar TPACK, serta aplikasi praktis dalam mengembangkan rencana pelajaran yang mengintegrasikan teknologi dan multimodalitas. Kegiatan ini dilaksanakan dari Oktober 2025 hingga November 2025 di SD Negeri 149 Palembang, diikuti oleh 23 guru. Metode implementasi meliputi empat tahap, yaitu identifikasi kebutuhan dan potensi guru melalui observasi dan wawancara; presentasi tentang teori dan praktik literasi multimodal dan TPACK; lokakarya tentang merancang pembelajaran berbasis TPACK dan multimodal; serta implementasi dan evaluasi aktivitas kelas. Didukung oleh aplikasi teknologi sederhana, seperti Canva dan aplikasi interaktif lainnya, kegiatan ini menghasilkan pemahaman tentang cara mengintegrasikan teknologi secara bermakna dengan pendekatan pedagogis

dan konten untuk menciptakan pengalaman belajar yang kaya dan menarik bagi siswa. Penggunaan Topworksheets merupakan salah satu alternatif yang dapat dipilih.

Kata Kunci: Aplikasi, Literasi, Multimodal, Numerasi, TPACK

INTRODUCTION

The Palembang city, South Sumatra Province, is a city with a diverse and distinctive community, including disparities in the quality of education, particularly at the sub-district level. One targeted sub-district of this community service is Gandus sub-district, in which SD Negeri 149 Palembang is the school partner. This school is located in a densely populated area with a lower-middle socioeconomic background (Yusuf & Batubara, 2021). Although this school has competent and enthusiastic teachers, the actual conditions show that learning still largely uses traditional methods and does not make optimal use of technology. Based on the results of observation and initial discussions with the principal and teachers, it was found that most teachers are not yet accustomed to applying the TPACK (Technological Pedagogical Content Knowledge) approach and multimodality in designing learning. However, correct development requires teachers to be adaptive to technology and capable of developing contextual and innovative learning. The TPACK framework is effective to integrate technology into learning, especially in elementary schools (Fara Agustin & Azmy, 2022).

Based on data from the PISA 2022 Indonesia Report (OECD, 2022), Indonesia still shows low literacy achievement. In the local context, teachers of SD Negeri 149 Palembang reported that many students were still unfamiliar with reading and writing in the context of visual texts, diagrams, and digital texts. Teachers conveyed that main obstacles in learning improvement are the lack of applicable training and limited understanding in utilizing simple digital media for contextual learning. This is exacerbated by the absence of English lessons at the elementary school level since the implementation of the 2013 Curriculum, even though students are already exposed to a digital world that is mostly based on foreign languages (Dikdasmen, 2025). Research findings indicate that elementary school students' literacy skills still require improvement. The implementation of multimodal literacy strategies—combining text, audio, visuals, and gestures—has been proven to enhance early reading comprehension by over 90% among first-grade elementary school students in first grade. (Lisa & Hanum, 2021). Additionally, in the context of basic education, multimodal literacy helps students develop 21st-century skills such as critical, creative, collaborative, and communicative thinking. (Dapodik, 2025)

These conditions indicate the need to improve teacher capacity through training that focuses not only on theory, but also on practical learning design that is current, relevant, and in line with school infrastructure. The TPACK-based multimodal literacy approach is a strategy that bridges these needs, as it enables teachers to develop meaningful, inclusive, and contextual learning. The following is information related to the profile of SD Negeri 149 Palembang.

This activity aims to improve the capacity of teachers at SDN 149 in Palembang to design and implement multimodal literacy learning designs based on the TPACK approach, thereby promoting adaptive learning quality in line with technology and 21st-century needs. This training will equip teachers with conceptual knowledge and practical skills in developing innovative teaching tools based on local and global contexts. Strategically, this activity is in line with Sustainable Development Goals (SDGs) point 4 about Quality Education, which is to ensure inclusive and quality education and support lifelong learning (United Nations, 2025); Key Performance Indicators (IKU) for Higher Education, specifically IKU 2 (students gaining experience outside campus), KPI 3 (faculty engaging in activities outside campus), and KPI 5 (faculty research outcomes utilized by the community) (Kemendikisaintek, 2025); The Five Impactful Behaviors of Science and Technology Higher Education, specifically: prioritizing the people, evidence-based approaches, and building collaborations with grassroots partners (Kemendikisaintek, 2025); and UNSRI's flagship program, namely improving the quality of basic education and strengthening assisted villages through sustainable programs based on research and community empowerment (UNSRI, 2025).

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This activity is designed not merely as one-way training, but as a two-way collaboration between the implementation team and teachers in the form of training, workshops, guided classroom practice, and joint reflection. Teachers will be facilitated to develop TPACK-based and multimodal lesson plans, integrate local culture (Palembang local wisdom) into literacy learning content, and access and utilize digital learning applications such as Canva, Topworksheets and many other applications in a contextual manner.

Through this activity, it is expected that a model for strengthening teacher capacity in multimodal literacy learning relevant to the needs of basic education in the digital era will be created. Multimodal literacy supports children's diverse learning styles and enriches their learning experiences. With a participatory and appropriate technology-based approach, this activity will not only provide direct benefits to teachers and students at SDN 149 Palembang, but also support efforts to achieve the SDGs, IKU Higher Education Institutions, and UNSRI's vision as an impactful campus through quality, inclusive, and sustainable education.

METHOD

RESEARCH LOCATION

This community service activity was carried out at SD Negeri 149 Palembang, located in Palembang, South Sumatra, Indonesia. The selection of this location was based on the school's need to improve the capacity and competence of its teaching staff, particularly in designing and implementing multimodal literacy instruction integrated with the Technological Pedagogical Content Knowledge (TPACK) framework.

Implementation Procedures

This activity was carried out using two modes, namely offline and online, using Zoom Conference. The model used in this activity was through assistance in the preparation of multimodal literacy learning designs based on the TPACK approach and product-based. This activity began with a presentation and FGD. The initial presentation was delivered by the resource persons with material explaining multimodal literacy, the TPACK concept, the technology used, and learning design. This was followed by an FGD (focus group discussion) aimed at enabling participants to share their experiences, understanding, and opinions after collectively identifying problems and developing more comprehensive solutions (Tarigan and Simamora, 2024). Next, the activity continued with practical assistance in developing TPACK-based multimodal literacy learning designs using technology (AI applications, such as Canva and Topworksheet). This stage was carried out in groups according to the level or class taught by the teachers. After the draft designs were completed, participants were invited to present their work by conducting practical examples in the classroom. Following is the timetable of the activity itself.

Table 1. Timetable

Day, date	Time (WIB)	Activity	Person in Charge
Thurs., 25-10-2025	10.00-12.00	Socialization	Team members
Sat., 04-10-2025	13.00-16.00	Pre-assessment test	Team members
Sat., 18-10-2025	10.00-12.00	Opening and Presentation	
		Theory: TPACK-based Multimodal literacy Learning design	Dra. Zuraida, M.Pd./Machdalena Vianty, M.Pd., M.Ed., Ed.D. Dr. Ismail Petrus, M.A./Amrullah, M.A., Ph.D.
Sat., 25-10-2025	10.00-12.00	Presentation and Practice	

		Technology use	Tita Ratna Wulan Dari, M.Pd./Muhammad Yazir, S.Pd., M.A.
		Product development	Hesti Wahyuni Anggraini, M.Pd./Dr. Yentri Anggraini, M.Pd.
Tues., 28-10-2025	Class (choose 1): Class 1: 07.00-10.00 Class 2: 10.30-13.30 Class 5: 07.00-12.00	Teaching simulation	Lianasari, M.Pd./Firma Pradesta Amanah, M.Pd.
Sat., 01-11-2025	10.00-12.00	Feedback Certificate delivery Closing	All team members

Sumber : Diolah oleh peneliti, 2025

The implementation of this community service activity was carried out through five systematic and interrelated stages, namely: socialization, training, technology application, mentoring and evaluation, and program sustainability. This series of methods was designed to produce real and sustainable changes in the learning practices of partner teachers.

a. Socialization and Theoretical Study

1. Conveying the background, objectives, and benefits of the activity.
2. Agreeing on the training schedule and form of partner involvement.
3. Conducting a pre-assessment of teachers' understanding of multimodal literacy and the TPACK approach through a questionnaire.
4. Presenting the concept of multimodal literacy, TPACK components, and supporting evidence from research.
5. Discussing similar PPM case studies at SD Negeri 149 Palembang.

b. Learning Design Workshop Community service team

1. Presentation of concrete examples (videos, flashcards, multimodal presentations).
2. Participants design multimodal literacy lesson plans in groups.

c. Technology utilization: Media Production Practices

1. Use of simple tools (interactive PowerPoint, Canva, Topworksheets).
2. Step-by-step guidance on creating multimodal media.

d. Assistance and Evaluation: Simulation and Reflection

1. Teachers use media in class during 2-3 meetings.
2. Observation, feedback, and improvement in the classroom.

e. Program Evaluation and Follow-up

1. Completion of the TPACK questionnaire, post-test on student literacy, and interviews.
2. The follow-up plan for the training is to develop a digital training guide module that can be reused by teachers.

The evaluation of this activity consisted of an initial assessment, a final assessment, and a reflection on the community service activities obtained through the completion of a survey. The data was analyzed using a descriptive approach.

RESULTS AND DISCUSSION

This community service activity was successfully held. The activity was carried out from October to November 2025 in the Meeting Room of SD Negeri 149 Palembang and was attended by 23 active teachers at the school. This activity was carried out by 1 chief executive, 8 lecturers, and 5 students.

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Through the five stages, at the first stage, socialization and theoretical study conducted a series of activities, like coordination with the Principal of SDN 149 Palembang regarding training needs and participant targets, as well as initial observation and identification of teacher needs related to the use of technology and the application of multimodal literacy in learning using an online questionnaire distributed via Google Form. This stage also included the preparation of training materials, worksheets, guidelines for the preparation of TPACK-based learning designs, and the preparation of evaluation instruments, attendance lists, and training modules.

In the second stage, the training was conducted over two main sessions, including classroom teachers and subject teachers. The training was conducted through a session on the basic concepts of TPACK and multimodal literacy, demonstration of the use of technology to support multimodal learning design, a workshop on developing TPACK-based learning design, and group practice in developing multimodal student worksheets. At the end of this stage, participants produced prototypes of TPACK-based learning designs that integrated content, pedagogical strategies, and the use of digital media such as design applications, instructional videos, and interactive visual resources.

At the last stage, after the training session, participants received supervision in refining multimodal LKPD using visual, audio, and interactive elements, presentations, and peer feedback among participants. Furthermore, program evaluation and sustainability assessments were conducted through a final online survey. The results of the mentoring show an improvement in the quality of the learning design, which can be seen in the clarity of the learning objectives, the diversity of material presentation modalities, and the integration of digital media.



Picture 1. Documentation of the training on designing TPACK-based multimodal literacy instruction at SD Negeri 149 Palembang.

Source: Author's personal collection



Picture 2. Documentation of the online training on designing TPACK-based multimodal literacy instruction at SD Negeri 149 Palembang.

Source: Author's personal collection

The implementation of this training program had a positive impact on improving teachers' competence in designing modern learning that is relevant to the needs of the 21st century. Based on the results of the initial and final evaluations, there were several important findings:

- a. Based on the reflection results gathered through the questionnaire, the majority of participants reported positive changes regarding their understanding of multimodal literacy, which improved from the 'fair' category to the 'good' category.
- b. Teachers' Ability to Develop Multimodal Literacy Learning. Participants successfully applied multimodal elements such as visuals, narrative texts, audio, and digital interactions in LKPD and learning tools. Teachers were able to present material in a more interesting and contextual manner, opening up opportunities for more varied, student-centered learning.
- c. Teacher Enthusiasm and Active Participation. During the workshop sessions, teachers were actively involved in discussions, asked critical questions, and presented creative learning designs. This shows that the training addressed the real needs of teachers in integrating technology and multimodal literacy in the classroom.
- d. Challenges and Obstacles. Some of the challenges encountered include variations in teachers' abilities in using digital applications, limitations of certain technological facilities in the classroom, limited time for the process of mentoring the refinement of learning designs. However, these constraints form the basis for recommendations for a follow-up program in the form of in-depth training on technology applications and the development of a teacher learning community.
- e. Implications of the Activity. This activity has significant implications for improving the quality of learning, where teachers are able to produce technology-based and multimodal learning innovation that are useful for improving student literacy and learning outcomes.
- f. Follow-up Plan. Based on the results of the implementation of the TPACK-Based Multimodal Literacy Learning Design Training at SDN 149 Palembang and the evaluation of the program's achievement of its objectives, there are several follow-up recommendations that need to be carried out to ensure the sustainability of the program's impact and the improvement of teachers'

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competencies in a more optimal manner, namely the implementation and testing of products in the classroom. Teachers are advised to apply the developed learning design and multimodal worksheets in actual classroom instruction as a pilot implementation phase, followed by reflection and improvement based on observation results.

The result of this community service was supported by a study by Joshi (2023). It showed that interventions for professional development were successful in raising teachers' self-efficacy in TPACK. Additionally, participants' opinions toward the use of technology in the classroom were strengthened via TPACK-based argumentation techniques. Then, a study conducted by Tan et al (2025) revealed that TPACK greatly improves teaching performance, that AI competency has a significant and positive impact on TPACK, and that TPACK mediates the relationship between teaching performance and AI competency. These findings offer empirical support for the critical role that integrated pedagogical, technological, and topic knowledge plays in improving teaching efficacy in AI-enhanced learning settings. AI technologies offer both new opportunities and higher expectations for teachers' professional development as they become more and more integrated into the educational process. A study done by Santosa and Dewi (2025) reported that these themes provide significant insights into the utilization of TPACK and its implications for ELT in the Indonesian context. Moreover, a study by Celik (2023) also reported that the orchestrator position calls for a teacher's instructional, ethical, and technical expertise. One strong framework for illuminating the abilities for AI-based training may be TPACK. The current study provides Intelligent-TPACK, an updated framework on teacher knowledge to integrate AI-based tools ethically.

CONCLUSION AND SUGGESTION

CONCLUSION

The delivery of material in this activity was successfully carried out and also achieved its intended objectives in accordance with the plans and goals set for the target audience, namely elementary school teachers teaching at SD Negeri 149 Palembang, South Sumatra. As explained in Chapter 1, this PPM activity is an effort to help improve teacher professionalism while also implementing the Tri Darma Perguruan Tinggi (Three Pillars of Higher Education). This activity also provided an opportunity for these teachers to improve the quality of their teaching through more meaningful and TPACK-based learning design improvements to achieve the planned learning objectives.

From this PKM activity, the following conclusions can be drawn. First, TPACK-based multimodal literacy supports children's diverse learning styles and enriches their learning experiences. Teachers as facilitators in learning and teaching activities are required to master technology-based pedagogical approaches such as TPACK (Technological Pedagogical Content Knowledge), which enables them to design meaningful learning by utilizing technology. Additionally, this PKM activity has advantages, including the ability of teachers to develop differentiated LKPD based on students' learning readiness, which includes diverse classroom activities, questions, and exercises. Furthermore, the interview results also showed positive aspects, namely the enthusiasm of teachers in participating in the activity.

RECOMMENDATION

Based on the results of the implementation of the TPACK-based Multimodal Literacy Instructional Design Training at SDN 149 Palembang, as well as the evaluation of the program's objective achievement, there are several follow-up recommendations that need to be implemented to ensure the sustainability of the program's impact and the optimal enhancement of teachers' competencies, namely the implementation and trial of the products in the classroom. Teachers are advised to apply the multimodal learning design and worksheets that have been developed in real classroom teaching as a pilot implementation phase, followed by reflection and refinement based on the results of observations.

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