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TEACHERS AS LEARNING MEDIA DESIGNERS: TRANSFORMING KNOWLEDGE INTO PRACTICE THROUGH COMMUNITY SERVICE

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Abstrak

Permasalahan guru di Indonesia banyak terkait dengan kompetensi pedagogik dan profesional. Salah satunya adalah permasalahan dalam pengembangan media secara mandiri. Pengabdian masyarakat ini merupakan solusi untuk mitra (dalam konteks aktifitas ini adalah guru sekolah dasar) dalam meningkatkan kemampuan pengembangan media. Ada tiga tahapan utama dalam kegiatan ini meliputi sosialisasi, pendampingan, dan diseminasi media. Pada kegiatan ini juga menginvestivigasi Reflective Mapping of the Teacher's Resource System (RMRS), untuk mengidentifikasi cara guru mengelola sumber daya yang digunakan dalam pengembangan media pembelajaran. Luaran dari pengabdian ini terlihat dari peningkatan kemampuan guru dalam mengembangkan media. Tiga dari lima belas guru mendiseminasikan media yang mereka kembangkan. Dari hasil analisis pada diseminasi dan juga wawancara kepada guru, didapatkan hasil RMRS yang menunjukkan guru memiliki variasi sumber daya dalam pengembangan media. Temuan dalam kegiatan ini menunjukkan bahwa selain program ini berkontribusi pada luaran produk media, namun juga memahami pola pikir guru bagaimana memanage sumber daya berdasarkan rasionalitas pedagogis dan koneksi antar sumber daya. Secara keseluruhan, kegiatan ini berorientasi pada proses terkait desain, bukan sekedar peningkatan keterampilan teknis. Aktifitas ini lebih menghighlight pada pengembangan guru profesional berkelanjutan, dan membentuk cara pandang guru yang sistematis dan holistik dalam mengatur dan memanfaatkan resources dalam mengembangkan media.

***Kata Kunci**: Pengabdian Masyarakat; Pengembangan Media Pembelajaran; Reflective Mapping of The Teacher's Resource System, Pengembangan Guru Profesional Berkelanjutan.*

Abstract

The majority of teacher problems in Indonesia are related to pedagogical and professional competencies. One of these is the problem of developing media independently. This community service program is a solution for community service partners (in this context, elementary school teachers) to improve their media development skills. There are three main stages in this activity: outreach, mentoring, and media dissemination. This activity also investigated the Reflective Mapping of the Teacher's Resource System (RMRS) to identify how teachers manage the resources used to develop learning media. The outcome

of this service is improved teachers' ability to develop media. Three of the fifteen teachers disseminated the media they developed. Based on analysis of dissemination and interviews with teachers, the RMRS results indicate that teachers have a variety of resources for media development. The findings of these activities indicate that this program not only contributes to media product output but also to understanding teachers' resource-management mindsets, grounded in pedagogical rationality and connections among resources. Overall, this activity is oriented toward design-related processes rather than merely improving technical skills in media development. These activities emphasize ongoing professional teacher development and foster a systematic, holistic perspective on the organization and use of resources in media development.

Keywords: Community Service; Learning Media Development; Reflective Mapping of the Teacher's Resource System, Professional Teacher Development.

INTRODUCTION

The main challenges facing teacher competency in Indonesia include pedagogical, professional, social, and personality issues (Hoesny & Darmayanti, 2021; Leonard, 2016). However, of these four, pedagogical and professional issues are often highlighted (Mia & Sulastri, 2023; Sele & Sila, 2022). Several studies have shown that a lack of pedagogical and professional skills leads to suboptimal planning, implementation, and development of learning materials, as well as in learning evaluation, which, in turn, directly impacts student performance (Mia & Sulastri, 2023; Sele & Sila, 2022).

Numerous cases demonstrate the pedagogical and professional weaknesses of teachers nationally, for example, the very low results of teacher competency tests (Kusumawati et al., 2017). Problems, such as teachers' skills in managing technology both inside and outside the classroom, also indicate weak pedagogical and professional abilities (Astuti et al., 2021; Machmud & Fakhri, 2021; Mutohhari et al., 2021). Furthermore, the lack of mastery of material, media development, and learning methods also serves as a negative indicator that Indonesian teachers are indeed weak in pedagogical and professional areas (Fahmi, 2013).

Similar problems were found among community service partners (in this article, some elementary schools in Tarakan). The schools received minimal outreach, mentoring, and training, leaving them unprepared to implement the curriculum, particularly to develop practical, feasible learning materials for classroom use. Many studies have highlighted that continuous mentoring significantly improves teacher competency (Handrianto et al., 2022; Pratama & Lestari, 2020; Sari & Rini, 2022; Shanks et al., 2022). These issues serve as the primary basis for this community service activity.

Scholars in educational technology or media development have conducted several studies/community activities on mentoring and training in developing learning media for teachers. For example, Kartikasari and Suryarini (2023) provided mentoring to develop blog-based learning media. Another activity was conducted

by Wahyuningsih and Nikmah (2023), who held a workshop on learning media for teachers. However, several previous activities focused only on media products, without conducting an in-depth analysis of how the sequence of resources used as elements within the media (Handrianto et al., 2022; Michailidi & Stavrou, 2021). Based on this, this activity conducted an analysis using the Documentational Approach to Didactics (DAD), which highlights how teachers interact with their resources in developing media (Trouche, 2019). One such analysis used Reflective Mapping of the Teacher's Resource System(RMRS) to structurally map the resources teachers use in media development (Trouche et al., 2023).

The community service activities in this article focus on outreach programs to develop learning media for teachers. As a representation of pedagogical and professional competence, media development is an urgent matter (alongside models and methods) that determines whether learning content can be optimally transferred to students. Pedagogical skill is reflected in teachers' ability to create or use media. Meanwhile, professional competence is reflected in teachers' abilities to manage and develop media content.

METHODS

Context of community service activity

This community service activity comprises three main components: introducing the learning media by the community service team (outreach), mentoring media development, and disseminating media products by teachers. The detailed stages in this community service activity are shown in Figure 1. The introduction to the learning media activity (outreach part) covers various types of learning media, including realia, visual, audio, audio-visual, and multimedia. Furthermore, this activity illustrates how the media can be implemented, including through game-based learning and gamification.

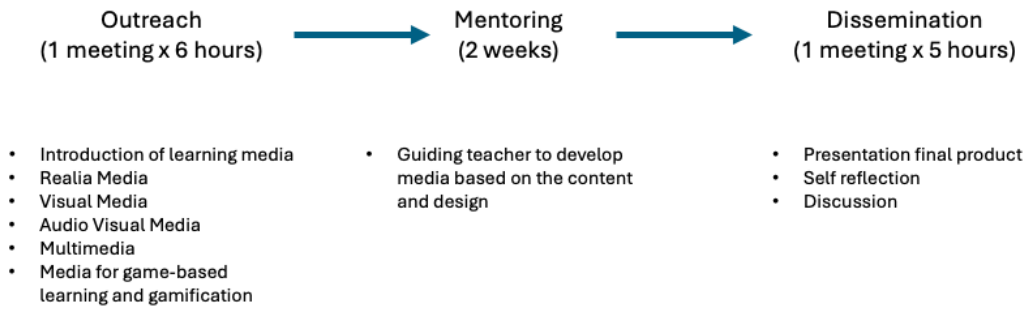

Figure 1. Phases of Community Service Activity

The team conducts mentoring activities, guiding teachers in developing their media and addressing both the technical and content aspects of media development. Finally, dissemination occurs when teachers present the results of their media

development. In the dissemination stage, teachers outline several key points that the team uses in data collection and analysis. These points include the media developed by the teachers, the resources they used, and other media they did not develop independently but used from other platforms. The evaluation of this activity utilizes a qualitative community service evaluation based on DAD.

Participants

Fifteen teachers from three elementary schools in Tarakan City, Indonesia, participated in this community service activity. During dissemination, three teachers volunteered to explain their media. The dissemination activities of these three teachers served as the primary data collection method (see the following subsection). The selection of participants for dissemination was based on the principle of voluntary participation, using a voluntary sampling design (Murairwa, 2015). This was crucial to ensure participants were prepared to explain in depth the development and reflection processes they underwent.

Benchmark of the activity

This community service activity has success benchmarks outlined in terms of outputs, outcomes, and impacts. These benchmarks are detailed in Table 1.

Table 1. Output, outcome and impact of the activity

Components	Description	Completion indicators
Output	Implementation of outreach, mentoring, and dissemination in the development of learning media that adhere to the Indonesian curriculum based on deep learning.	Activities were carried out in accordance with the community service plan, and teachers developed at least a draft of the media.
Outcome	Increased understanding and reflection of teachers as media designers and educators (according to the RMRS analysis).	Several teachers were able to explain and reflect on the media they developed.
Impact	Realization of continuous strengthening of teacher professionalism and innovative learning in the classroom.	Teachers demonstrated initiative in further media development and commitment to implementing it in the classroom.

Data Collection

Data collection in this study focused on identifying the resources teachers use in media development. Data were collected using the Reflective Mapping of the Teacher's Resource System (RMRS) (Ahl et al., 2022; Baştürk-Şahin & Tapan-Broutin, 2018; Trouche, 2019; Trouche et al., 2020). Identification was conducted through video recordings of teachers conducting dissemination activities. During the dissemination, teachers described the media they developed and the resources

they used. Additional data was obtained from semi-structured interviews with the teachers who disseminated the media.

Data Analysis

The results of the teacher dissemination videos were analyzed using thematic analysis (Braun & Clarke, 2012), identifying key themes related to the RMRS. This theme mapping was conducted by two coders (the first and second authors) iteratively until consensus was reached.

RESULTS AND DISCUSSION

Results

The results will explain the overall activities carried out. This section focuses on the main activities related to outreach, mentoring, and dissemination, and concludes with an analysis of resource variations across the RMRS.

Learning Media Outreach and Mentoring

The primary focus of outreach and mentoring activities for creating learning media is to provide teachers with an overview of the available types of learning media. The outreach begins with an introduction to learning media types, including realia (real objects), visual media, audio media, audiovisual media, and multimedia, as shown in Figure 2. Furthermore, this section explains how to use these media in learning contexts, such as gamification and game-based learning. In this outreach, the community service team also outlines how to integrate media into the Indonesian curriculum, emphasizing deep and differentiated learning.

Figure 2. Learning Media Outreach and Mentoring

Based on interactions between the community service team and teachers during the outreach, it became evident that while most teachers still had limitations in developing contextual, curriculum-relevant learning media. However, their

foundational understanding regarding media development was quite strong. As the sessions progressed, teachers participated more actively in discussions and focused heavily on the challenges they face in their duties and in the classroom. After the outreach, the next stage was media development mentoring. During the mentoring, teachers identified subject content to be transformed into learning media. The community service team also inquired about local potential that could be contextualized within the developed material. This mentoring led to numerous media development ideas, including posters, realia, and 3D modelling.

During the mentoring, teachers were not only mentored by the community service team but also engaged in peer discussions to gain insights from other teachers on the potential uses of the media and its implementation weaknesses. The final result of this stage was the production of a media product suitable for classroom use. The media is also unique because it leverages local potential in its contextualization.

Outreach activities, as the initial stage of this community service, help build awareness and understanding of the activity's content. Reflectively, outreach serves not only as a platform for delivering core content but also as a means of uncovering practical examples and challenges encountered in learning. Therefore, outreach activities can be enhanced by incorporating discussions of these issues. These discussions serve as a trigger for teachers to actively enter the mentoring phase on a case-by-case basis. The mentoring phase, which follows the outreach practice, illustrates the teacher's role as a recipient of an active developer's media design. In this activity, teachers demonstrated their independence in planning and developing media, though in the initial stages, they remained heavily dependent on the community service team.

In this mentoring, teachers developed media not only based on textbooks as the primary content but also using multiple sources and digital platforms in content development and media design. This process demonstrates teachers' reflective awareness of media as a complex integration of development techniques, experience, knowledge sources, and learning contexts. At this stage, teachers were able to plan the media they developed. Some teachers had already developed final products, while others were still in the rough-draft stage of their prototypes. It demonstrates the success of a community service activity. All outreach and mentoring activities fostered confidence in realizing ideas and fostered a sense of ownership over the media being developed. This activity was concluded with a photo of the participants, as shown in Figure 3.

Figure 3. Conclusion of The Mentoring

Media Dissemination

The activity continued with the dissemination phase, involving three teachers. The dissemination aimed to explore the extent to which media had been developed and disseminated within the community among teachers, as part of a platform to showcase and explain the development process intended for classroom use. The first teacher presented a realia model of a virus made from recycled paper. The virus model depicted several key components, including the capsid and genetic material, as well as additional parts: collar, sheath, base plate, and tail fibers (the teacher created a T/bacteriophage virus model). An illustration of the model is shown in Figure 4a. The teacher explained that creating a virus model is crucial because, although it is available in textbooks, students need a spatial and tangible representation of the objects. The teacher added that models are necessary because it is impossible to observe viruses with the naked eye, unlike larger biological specimens that can be used directly in the classroom.

The second teacher presented media related to geometric shapes (see Figure 4b). She developed realia models of geometric shapes and also presented digital geometric shapes in GeoGebra. The use of these two media types provided students with different experiences, both physical and digital. Physical realia media helped them understand shapes, sides, and edges concretely. Meanwhile, digital media facilitated digital-based manipulation and interactivity. The combination of the two enriched the students' classroom experience. The third teacher presented an educational poster about the environment (see Figure 4c). The teacher-developed poster presented important information concisely and clearly. It also included visual elements, such as trees. In her presentation, the third teacher exemplified that this poster was a supporting medium for classroom display, serving as a starting point

for discussion. Therefore, the poster's role here was not only as an informative medium but also as a catalyst for student interest, balancing information with a harmonious visual element.

Figure 4. Media Dissemination: a) Example of Virus Model; b) Geometric Shape Media; c) Poster Media

Overall, media dissemination demonstrated that teachers were able to connect their planned ideas into creative media. The goal of this stage was to strengthen teachers' motivation to develop ideas that could be replicated in media development and used as best practices for innovative learning in the classroom. Although dissemination is generally understood as conveying results, in this activity it serves as a means of ongoing reflection. The purpose of continued reflection is to illustrate how teachers reflect on their thinking process in media development. This thinking process encompasses several aspects, such as how resources are selected and used, as well as the pedagogical considerations that underpin media development. This ongoing process views media development not simply as an aesthetic product but as an integrated resource-management system.

This activity demonstrates that some teachers are already able to explain and reflect on media development. The interactive question-and-answer process during dissemination, as well as discussions with other teachers, demonstrates dissemination as a collective reflection, enabling consideration of media development or use in different contexts. Furthermore, dissemination contributes to strengthening the formation of a sustainable learning community.

Reflective Mapping of the Teacher's Resource System

The analysis of the Reflective Mapping of the Teacher's Resource System (RMRS), based on teacher dissemination and interviews, yielded the mapping shown in Figure 5. Teachers used diverse approaches, some similar and others different. The results indicate that all teachers relied on their textbooks to create the bulk of their media content. For realia media, teachers generally used construction material resources. For example, in developing virus models and spatial models, teachers used construction materials from reused materials. Interestingly, teachers

not only used textbooks as their primary source of content, but also sought ideas from online references. For example, in creating virus models, the first teacher looked for image references online. Another example is that, when creating spatial structures (both physical and digital), the second teacher searched for YouTube tutorials.

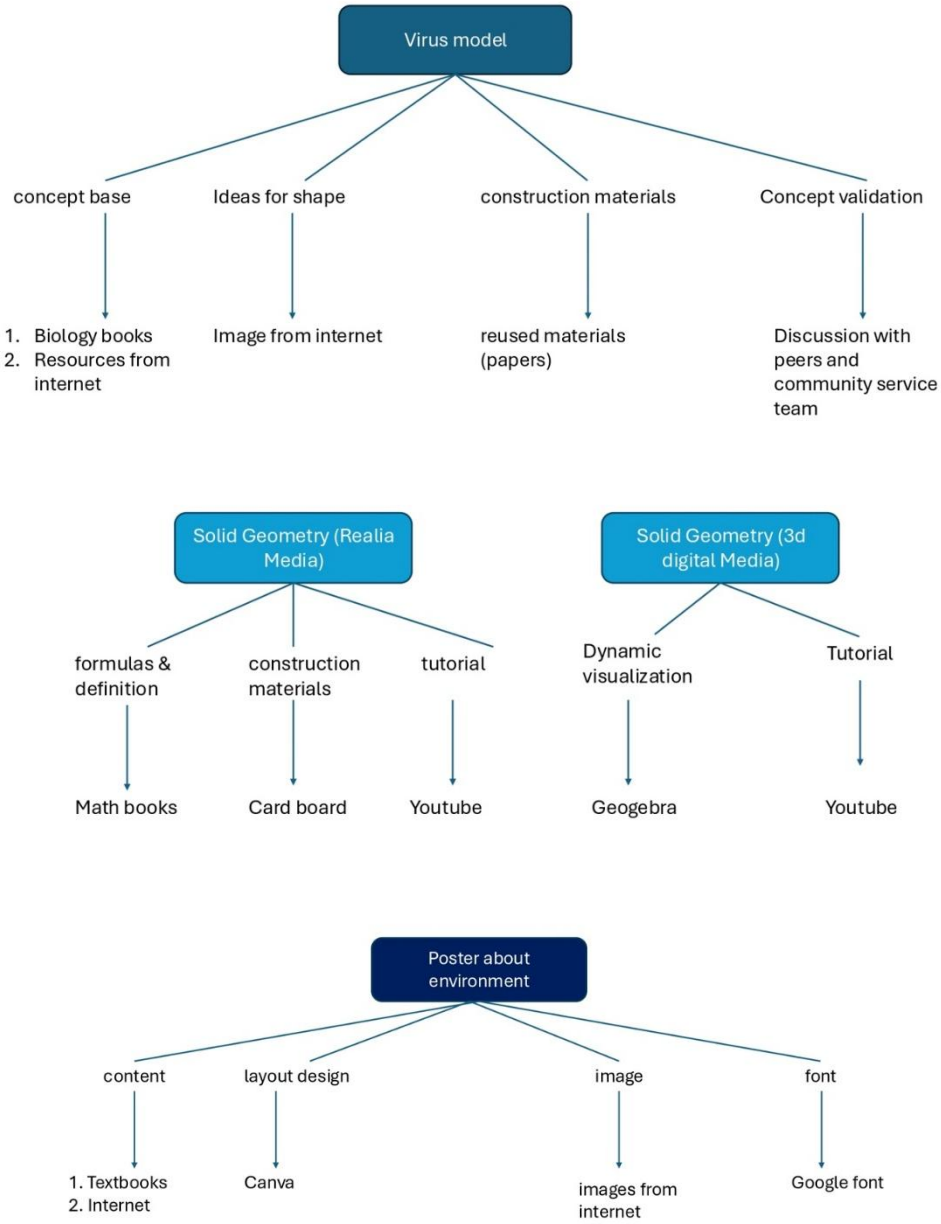

Figure 5. Reflective Mapping of the Teacher's Resource System

The use of online platforms is also evident in the development of digitally designed media. For example, the second teacher used GeoGebra to develop a 3D model of a geometric figure. Another example is the third teacher's use of Canva to design a learning poster. Other examples of the use of educational resources on the internet, such as images, are also evident in the RMRS in-depth investigation. For

example, the third teacher, who developed the poster, added visual elements by searching online for references. She also searched for several free-to-use font references on Google Fonts.

Another interesting aspect was the first teacher's emphasis on concept validation through discussions with fellow teachers and the community service team. It demonstrates that the first teacher carefully considered media development to avoid conceptual errors. Discussions with peers are crucial, as cross-checking content and media formats is often a core element in validating the development of learning media.

Discussion

Based on the outcomes of this community service program, three key points are discussed in this section. First, the outreach and mentoring activities serve as a form of knowledge transfer to practical transformation. Second, the dissemination activity illustrates how dissemination is not only a reflective process but also a form of communication with the community. Finally, the RMRS investigation illustrates the differences in teachers' thinking styles in developing learning media. Outreach and mentoring: A form of knowledge transfer to practical transformation

The most interesting outcome of this community service activity is that the outreach and mentoring align with constructivism (Hyslop-Margison & Strobel, 2007; McCauley et al., 2018), positioning teachers as learning designers (Scott & Lock, 2021). The outreach, which is the transfer of technical knowledge related to learning media and its development, is reinforced by mentoring, which is a practical transformation. Similar community service initiatives have shown that programs that begin with content delivery and are followed by hands-on mentoring are more effective, transforming knowledge into practice and further strengthening participants' skills (Haanurat et al., 2024; Michailidi & Stavrou, 2021; Mora et al., 2025).

Teachers, as learning designers, position themselves not only as media users but also as media developers (Scott & Lock, 2021). It demonstrates that practical community service activities are not merely about transferring knowledge but also about activating participants' skills as a form of knowledge construction. It reveals a component of professional empowerment. Previous studies on community service activities that positioned participants as active rather than passive recipients showed higher levels of participants' engagement and satisfaction (Christwardana et al., 2022; Dewanti et al., 2021).

In brief, outreach and mentoring activities, in addition to being closely aligned with constructivist theory, also confirm that teachers can play a key role in developing innovative learning media. Dissemination is generally associated with sharing experiences or showcasing results (Senapathi, 2011). However, in the context of community service, dissemination is more often conceived as a reflective component of the activity (Arslan & Başağa, 2010). Teachers not only explain the

media they developed, but also the sources of the resources and the processes used to create them. Furthermore, teachers outline their plans for its use in the classroom as part of long-term planning for learning media.

In the context of a documentational approach to didactics, this is often associated with a teacher's learning resource map (Ahl et al., 2022; Trouche, 2019). This mapping is closely related to teachers' ideas about producing a media product. In this activity, dissemination is not only a reflective part but also a form of communication with the community. Teachers describe their work as part of inspiring other teachers. This system positions dissemination as a professional learning space, thereby forming a network among teachers that, in the future, can enable them to interact and exchange ideas on the development of learning media. Overall, this community service demonstrates the primary value not only of the media product's output but also of the pedagogical dialogue between teachers.

The RMRS, used as part of the final evaluation of this community service activity, reflects the teachers' thinking styles. The RMRS demonstrates that teachers' development of learning media demonstrates a complex array of resources. Previous research has shown that the variety of resources in the RMRS reflects teachers' experience in gathering information sources to design classroom learning. The RMRS results indicate that this community service activity helps teachers build a resource ecology. We created this terminology to represent the network of resources that teachers build from their experiences and adaptively use in media development. It is important to discuss because this activity directly contributes to pedagogical capacity in both the short and long term, particularly through teacher professional development that focuses on pedagogical and professional skills.

Upon closer examination, the three teachers differ in their thinking styles, as seen in their RMRS. The first teacher tends to be more concrete and structured, as evidenced by her design of the virus model. She considered both textbook and image sources to create a realistic model that represents an abstract concept. The second teacher tends toward an integrative style, combining realia and digital. Her media combination provides a distinct experience in both real life and the digital environment. Meanwhile, the third teacher tends to favor a visual communication style, with the ability to summarize and present material in visual form to facilitate audience understanding. While previous RMRS research may not have highlighted this, this community service demonstrates that teachers possess distinct and unique thinking styles.

CONCLUSIONS AND SUGGESTIONS

This community service activity highlights the unique and innovative potential of teachers in learning media development through a continuous and systematic approach encompassing outreach, mentoring, and dissemination. The program enhanced teachers' understanding of media concepts and supported their

production of diverse learning media, as demonstrated during the final dissemination, which showcased virus models, geometric shapes, and educational posters that reflected varied media types and content. Reflective Mapping of the Teacher's Resource System (RMRS), derived from dissemination outcomes and teacher interviews, revealed diverse approaches to managing and using resources during media development. Overall, the integrated stages of the activity produced holistic, efficient, and practical outcomes, while RMRS emerged as a valuable reflective evaluation tool for future use, enabling schools to identify and strengthen existing resources or introduce new ones to optimize the development of innovative media. Furthermore, the findings imply that improving teacher competency at the regional education office level requires systematic, sustained programs, with RMRS serving as an initial diagnostic framework to inform the design of effective, targeted teacher training initiatives.

For the development of future community service activities, the results of this activity indicate that community service is not only evidenced by products but also measured by changes in participants' thinking and reflection. In the future, follow-up programs could focus on deepening specific areas within a single media type through multi- or transdisciplinary integration. The pattern in this service and the RMRS analysis can be implemented or replicated at a broader scale, using a shared resource repository and online meetings via hybrid and blended learning.

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