



Unleashing Creativity: Junior High School Teachers Master Scientific Writing with Jigsaw Audiovisual Method

Asriani Abbas, Ikhwan Ikhwan, Haryeni Haryeni, Abbas Abbas, Indarwati Indarwati
Universitas Hasanuddin, Makassar, Indonesia

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Abstract (English: 10 PT)

This community service initiative focuses on enhancing the critical thinking skills of junior high school teachers in problem identification, development, synthesis, and systematic formulation of research outcomes, with a thematic emphasis on "Local Wisdom" aligned with the Pancasila principles in the Prototype curriculum. The project utilizes the Jigsaw Audio-visual (J-AV) method to support teachers in effectively conceptualizing scientific work. Conducted by the Hasanuddin University Faculty of Cultural Sciences team in Maros Regency, Indonesia, the initiative involved workshops covering topics such as the Audio-visual-Based Jigsaw Method, Language Rules for Scientific Writing, Conversion of Scientific Works into Popular Articles, and Simulation of the J-AV Method. The workshop engaged 20 teachers from Petama Middle School, aiming to equip them with the necessary skills to write audio-visual-based scientific papers. The team, comprising lecturers including Asriani Abbas, Abbas, Ikhwan M. Said, Haryeni, Indarwati, and Basri, facilitated the sessions on February 28-29, 2023. The significance of this endeavour lies in its potential to empower teachers with innovative tools and methodologies to enhance their scientific writing capabilities, ultimately benefiting both educators and students in the academic realm.

Corresponding Author: Abbas, email: asriani.abbas@unhas.co.id

1. Introduction

The jigsaw method is a cooperative learning approach where teachers collaborate in groups to enhance their understanding of the subject matter, leading to improved learning outcomes (Karaçöp, 2017). This method emphasizes collaboration over competition, creating a supportive environment for students to learn from each other (Halimah & Sukmayadi, 2019). Research has shown that implementing the jigsaw method can enhance students' learning achievements by encouraging active participation and peer interaction (Karaçöp, 2017). The Studies have demonstrated the effectiveness of the jigsaw method in improving pedagogical knowledge, communication skills, reading comprehension, vocabulary mastery, and teaching complex subjects like anatomy and clinical skills (Udin & Putera, 2022; Oakes et al., 2018; Hidayati & Rohayati, 2017).

Furthermore, the method fosters essential skills such as teamwork, critical thinking, and problem-solving (Reba et al., 2022). In medical education, the jigsaw method has been used to enhance residents' knowledge and attitudes in managing specific healthcare topics (Ng et al., 2020; Asif et al., 2021). The jigsaw method has been found to be engaging and enjoyable for students, leading to increased motivation and interest in learning (Walker et al., 2015). By promoting active participation and peer teaching, the jigsaw method caters to diverse learning styles and preferences, creating a dynamic learning environment (Karaçöp, 2017). Overall, the jigsaw method is a versatile and effective approach in education, offering numerous benefits for both students and teachers alike.

To further elaborate on the challenges faced by teachers at SMP Negeri 13 Bontoa in Maros Regency regarding Scientific Writing (KTI) and the implementation of the jigsaw method, additional research and resources can provide valuable insights. One study by Saguni (2013) highlights the importance of collaborative learning methods like the jigsaw technique in improving learning achievements by fostering group work and exploration of lecture materials.

This underscores the significance of implementing such cooperative learning strategies to enhance teachers' understanding and proficiency in scientific writing. Moreover, research by emphasizes the benefits of using the jigsaw method in laboratory practices to promote cooperation and remove competition among students, which can be extrapolated to teacher training scenarios. further support the role of the jigsaw method in enhancing pedagogical knowledge and communication skills, which are essential for effective scientific writing and research dissemination. These studies collectively underscore the potential of the jigsaw method in improving educational outcomes and professional development.

In addressing the identified challenges faced by teachers, training programs tailored to enhancing scientific writing skills, data handling techniques, and research report structuring are crucial. By incorporating elements of the jigsaw method into these training sessions, educators can benefit from collaborative learning experiences that promote active participation, peer interaction, and skill development. Additionally, integrating problem-based learning approaches within the training curriculum can further enhance teachers' abilities to critically analyse data, formulate research questions, and present findings effectively.

By drawing on the insights from existing research and educational practices, teachers at SMP Negeri 13 Bontoa can benefit from targeted training programs that not only address their current challenges in scientific writing but also equip them with the necessary skills and knowledge to produce high-quality research outputs. Through a comprehensive approach that combines the jigsaw method, problem-based learning strategies, and focused training modules, educators can enhance their professional competencies and contribute meaningfully to the advancement of educational research and practice.

The initiative to enhance teachers' proficiency in Scientific Writing (KTI) at SMP Negeri 13 Bontoa, Maros Regency led to the integration of the jigsaw method with audio-visual media (J-AV) in training sessions. Anderson (1994) defines audio visual media as a combination of electronic images with audio elements, facilitating efficient information processing and idea expression, which is crucial for teachers to analyse, evaluate, and reflect on their work effectively. By incorporating the J-AV method, teachers are guided to present systematic reports that document their activities comprehensively, especially in data search and collection processes, ensuring a thorough description of all gathered information.

The utilization of audio-visual media in educational settings has been recognized for its effectiveness in enhancing learning outcomes and knowledge acquisition. Research by Nicolaou et al. (2019) emphasizes the role of technology-enhanced learning methodologies through audio visual media in improving educational practices, highlighting the importance of flexible and rapid communication facilitated by such media. Similarly, the study by Febriyani et al. (2022) demonstrates how educational videos can enhance knowledge and behaviour, underscoring the impact of audio-visual media on learning outcomes.

By integrating the jigsaw method with audio visual media, teachers can benefit from a dynamic and engaging learning environment that promotes active participation, information processing, and idea expression. The combination of these approaches not only enhances teachers' proficiency in scientific writing but also equips them with the necessary skills to analyse, evaluate, and present their research findings effectively. Through comprehensive training programs that leverage the J-AV method, educators at SMP Negeri 13 Bontoa can enhance their scientific writing skills, data handling techniques, and research report structuring, ultimately contributing to the production of high-quality academic work that aligns with the standards of scholarly research and publication.

Likewise, the dissemination of information will be easy to understand. Audio visual assistance will seem more communicative because the output can be seen visually and also heard additively, making it easier for teachers to process and analyse data and give systematic meaning to the information obtained. Finally, the results can be expressed in the form of a scientific work report that is high quality, very accurate and can be accounted for.

Based on the problems mentioned above, the Department of Indonesian Literature, Faculty of Cultural Sciences, Hasanuddin University, as a leading university that upholds the Tri Darma of Higher Education, needs to take concrete steps to help teachers through community service in the form of training in the application of the audio-visual based jigsaw method. in preparing the scientific work of teachers at SMP Negeri 13 Bontoa, Maros Regency.

2. Literature Review

Etymologically, jigsaw comes from English, namely "jigsaw" and there are also those who call it fuzzle, namely a puzzle that assembles pieces of cooperative learning images. Cooperative learning is a learning strategy, namely students learn in small groups with heterogeneous levels of cognitive ability (Gulo, 2008). Jigsaw was first developed and tested by Elliot Aronson and his friends at the University of Texas. Later, the jigsaw was adapted by Slavin and his friends at John Hopkins University into a learning model known as the jigsaw type (Slavin, 2005).

In implementing the jigsaw cooperative learning model, the service team focuses on the teacher's background experience and helps activate their schemata to enhance the lesson's meaning. Teachers engage in collaborative learning with peers, fostering mutual cooperation, processing information, and improving communication skills. The jigsaw technique involves group members mastering specific parts of the material and teaching it to others in their group (Perry & Lewis, 2008). The benefits of the jigsaw cooperative learning model include enhanced conceptual understanding, improved learning outcomes, and enhanced speaking skills among students (Drouet et al., 2023). This model positively impacts students' cognitive learning outcomes across various subjects (Fletcher et al., 2012). Research supports that implementing the jigsaw cooperative learning model can boost students' learning activities, academic achievements, and critical thinking skills (Suparto et al., 2021). Therefore, the adoption of the jigsaw cooperative learning model significantly enhances students' learning outcomes and promotes a collaborative learning environment.

In the Jigsaw type cooperative learning model, there are two main types of groups: home groups and expert groups. The home group, also known as the parent group, consists of teachers with diverse abilities, origins, and knowledge backgrounds. This group serves as the initial team that each teacher belongs to before breaking into specialized groups. The diversity within the home group ensures a wide range of perspectives and skills, fostering a rich environment for collaborative learning and discussion. This varied composition promotes a dynamic exchange of ideas and enhances the collective problem-solving capabilities of the group. The expert group, on the other hand, is formed by taking one member from each home group and assigning them to study a particular topic in depth. Members of the expert group collaborate to understand and master their assigned content, working together to complete tasks and develop a thorough comprehension of the material. Once proficient, these experts return to their respective home groups to share their newly acquired knowledge. They explain the topic they studied, ensuring that all members of the home group benefit from the specialized insights of each expert. This method not only promotes cooperative learning but also ensures that all participants gain a comprehensive understanding of various topics through collaborative teaching and learning.

3. Method

To enhance the effectiveness of the training program for teachers at SMP Negeri 13 Bontoa in Maros Regency, a comprehensive analysis of the planning, training activities, implementation, and evaluation is essential. The initial phase involves the selection of 30 teachers for the training program, followed by providing them with reading materials on scientific paper writing techniques using the lecture method. During the training activities, facilitating in-depth discussions and group question-and-answer sessions guided by four facilitators can promote active engagement and knowledge retention among the participants.

To further enhance the training activities, integrating audio-visual based methods like the jigsaw technique can provide a dynamic and interactive learning experience for teachers (Heikkilä et al., 2018). By leveraging audio-visual cues and multimedia resources, teachers can improve their information processing and idea expression skills, leading to more effective scientific writing practices (Alghamdi et al., 2017; Li et al., 2021). In terms of implementation, ensuring that each teacher actively participates in discussions and prepares discussion reports can promote accountability and knowledge application. Implementing role-play scenarios using the audio-visual based jigsaw method on the second day can further reinforce the concepts learned and encourage practical application of the training content (Grasso et al., 2019). By incorporating elements of self-supervised learning and anomaly detection, the implementation phase can be enhanced to provide personalized feedback and adaptive learning experiences for teachers (Hu et al., 2019; Ma et al., 2021).

In the evaluation phase of the training program for teachers at SMP Negeri 13 Bontoa in Maros Regency, it is crucial to conduct pre- and post-training assessments to gauge the impact of the program on

teachers' scientific writing skills and data handling techniques. These assessments can provide valuable insights into the effectiveness of the training program. Additionally, incorporating metrics for self-supervised learning and audio-visual correspondence can offer a comprehensive evaluation of the training outcomes, enabling the identification of areas for improvement and informing future iterations of the program. By integrating advanced methodologies and technologies into the planning, training, implementation, and evaluation phases, the training program can be optimized to enhance teachers' scientific writing capabilities and professional development effectively. This holistic approach ensures that the training program aligns with the evolving educational landscape and equips teachers with the necessary skills to excel in scientific writing and research endeavours.

4. Results and Discussion

The Hasanuddin University Faculty of Cultural Sciences community service team carried out activities in Maros Regency, Indonesia on Tuesday-Wednesday, 28-29 February 2023. This team consists of a number of lecturers, namely Asriani Abbas, Abbas, Ikhwan M. Said, Haryeni, Indarwati, and Basri. On the first day, the team conducted a workshop with the presentation material being the audio-visual Based Jigsaw Method: An innovation to increase the capacity to write scientific papers, Language Rules for Writing Scientific Works, Conversion of Scientific Writings into Popular Scientific Papers (Opinion Articles), and Implementation/Simulation of the audio visual Based Jigsaw Method. Participants in the workshop on implementing the jigsaw method for writing audio-visual-based scientific papers were 20 Petama Middle School teachers as listed in table 1.

Table 1. Teachers Participating in Community Service Workshop In

No.	Name	Work	Gender
1	Irwan	Teacher	Male
2	Muhammad Anwar	Teacher	Male
3	Safri	Teacher	Male
4	Hamka	Teacher	Male
5	Samauli	Teacher	Male
6	Tajuddin Kacang	Teacher	Male
7	Haeruddin	Teacher	Male
8	Irmayana	Teacher	Female
9	Rahmawati	Teacher	Female
10	Sarina Mansyur	Teacher	Female
11	Asia	Teacher	Female
12	Nurlinda	Teacher	Female
13	Haijah	Teacher	Female
14	Nurafifah	Teacher	Female
15	Nasrah	Teacher	Female
16	Agustina	Teacher	Female
17	Radiah	Teacher	Female
18	Rosma	Teacher	Female
19	Hasriani	Teacher	Female
20	Chaerani	Teacher	Female



Figure 1. The team, presenting jigsaw learning materials in front of teachers

Prior to engaging in the writing workshop centered around a specific theme, the Community Service Team from the Faculty of Cultural Sciences at Hasanuddin University administered a pre-test. This preliminary assessment was conducted to evaluate the teachers' baseline proficiency in scientific work creation before introducing them to the jigsaw method of composing audio-visual based scientific content. This approach aligns with the assessment strategies recommended by Widodo and Pratomo, ensuring a comprehensive understanding of the teachers' initial capabilities and providing a benchmark for measuring their progress throughout the workshop and training activities. By conducting a pre-test, the Community Service Team aimed to tailor the workshop content to the teachers' current skill levels, thereby maximizing the effectiveness of the training program. This initial assessment also serves as a diagnostic tool to identify specific areas of improvement and customize the learning experience to address the teachers' individual needs. Through this structured approach, the training program can be fine-tuned to cater to the diverse skill sets and learning preferences of the participating teachers, ultimately enhancing their scientific writing abilities and fostering professional development.



Figure 2. Teachers carry out an audio-visual-based jigsaw learning simulation

The enhancement in academic performance can be attributed to various factors. Firstly, the utilization of audio-visual media aided participants in grasping the intricacies of scientific paper writing. Secondly, collaborative efforts among group members facilitated the generation of writing ideas. Moreover, the conducive and relaxed work environment promoted seamless idea exchange. The team's emphasis on completing scientific writing tasks contributed to heightened work efficiency and effectiveness. This surge in accomplishments underscores the success of community service initiatives undertaken by the lecturers at the Faculty of Cultural Sciences, Hasanuddin University in achieving their set objectives and goals.

Research has indicated that the incorporation of technology, particularly audio-visual media, in educational practices plays a pivotal role in enhancing learning outcomes. Studies have shown that the integration of audio-visual media in teaching enhances students' learning experiences and skills.

Furthermore, the efficacy of audio-visual media in improving learning outcomes has been underscored across various educational contexts, emphasizing its positive influence on student performance. audio visual tools have been particularly effective in enhancing students' soft skills, such as creativity and enthusiasm.

In conclusion, the integration of audio-visual media in educational settings has proven to be instrumental in improving learning outcomes, fostering collaboration, and creating a conducive learning atmosphere. By effectively leveraging audio-visual resources, educators can significantly enhance student engagement, comprehension, and overall academic achievements.

6. Conclusion

Upon receiving a demonstration of the jigsaw method for crafting audio-visual-based scientific work, teachers experienced a notable enhancement in the quality of their scientific endeavours, transitioning from a good to a very good category. A comparison between the pre-test and post-test results revealed a significant increase across all assessment aspects, with the total average score rising from 72.12 (good category) to 82.81 (very good category). The utilization of the jigsaw method, coupled with audio-visual elements, proved instrumental in elevating the teachers' scientific output. This approach not only boosted the quality of their work but also enhanced their understanding and application of scientific concepts. By incorporating innovative teaching methodologies like the jigsaw technique, educators can effectively engage students and improve learning outcomes. The integration of audio-visual media in educational practices has been shown to enhance comprehension, creativity, and overall academic performance. The successful application of the jigsaw method, supported by audio-visual aids, underscores its efficacy in enhancing scientific writing skills and fostering a deeper understanding of complex concepts. By embracing such progressive teaching techniques, educators can empower students to excel academically and cultivate a passion for scientific exploration.

References

- Anderson, B. (1991). *Imagined communities: Reflection on the origin and spread of nationalism*. Courier Companies, Inc.
- Asif, U., Bano, N., Malick, N., & Ansari, S. A. (2021). A mixed method evaluation of cooperative learning using jigsaw classroom model in clinical pharmacology course. *Research Square*. <https://doi.org/10.21203/rs.3.rs-1036508/v1>
- Drouet, O., Lentillon-Kaestner, V., Roure, C., & Margas, N. (2023). The role of the type of sport in the effects of the jigsaw method on students' motivation and moderate to vigorous physical activity in physical education. *Journal of Teaching in Physical Education*, 42(2), 301-312. <https://doi.org/10.1123/jtpe.2021-0223>
- Febriyani, P. A., Ismail, D., & Ningsih, S. R. (2022). Improvement of knowledge, attitude, and behavior of toddler feeding through nutrition education video. *International Journal of Health Sciences*, 552-565. <https://doi.org/10.53730/ijhs.v6ns9.12224>
- Fletcher, J., Grimley, M., Greenwood, J., & Parkhill, F. (2012). Motivating and improving attitudes to reading in the final years of primary schooling in five New Zealand schools. *Literacy*, 46(1), 3-16. <https://doi.org/10.1111/j.1741-4369.2011.00589.x>
- Gulo, W. (2008). *Strategi belajar-mengajar*. Grasindo.
- Halimah, L., & Sukmayadi, V. (2019). The role of "jigsaw" method in enhancing Indonesian prospective teachers' pedagogical knowledge and communication skill. *International Journal of Instruction*, 12(2), 289-304. <https://doi.org/10.29333/iji.2019.12219a>
- Hidayati, F., & Rohayati, D. (2017). The effectiveness of jigsaw on reading comprehension of analytical exposition text. *JALL (Journal of Applied Linguistics and Literacy)*, 1(2), 1. <https://doi.org/10.25157/jall.v1i2.1732>
- Karaçöp, A. (2017). The effects of using jigsaw method based on cooperative learning model in the undergraduate science laboratory practices. *Universal Journal of Educational Research*, 5(3), 420-434. <https://doi.org/10.13189/ujer.2017.050314>

- Ng, P., Kranz, K., Abeles, R., Schwartz, D., & Lane, S. (2020). Using the jigsaw teaching method to enhance internal medicine residents' knowledge and attitudes in managing geriatric women's health. *MedEdPORTAL*. https://doi.org/10.15766/mep_2374-8265.11003
- Nicolaou, C., Matsiola, M., & Kalliris, G. (2019). Technology-enhanced learning and teaching methodologies through audiovisual media. *Education Sciences*, 9(3), 196. <https://doi.org/10.3390/educsci9030196>
- Oakes, D. J., Hegedus, E., Ollerenshaw, S., Drury, H., & Ritchie, H. E. (2018). Using the jigsaw method to teach abdominal anatomy. *Anatomical Sciences Education*, 12(3), 272-283. <https://doi.org/10.1002/ase.1802>
- Perry, R., & Lewis, C. (2008). What is successful adaptation of lesson study in the U.S.? *Journal of Educational Change*, 10(4), 365-391. <https://doi.org/10.1007/s10833-008-9069-7>
- Reba, P., Susithra, N., Deepa, M., & Santhanamari, G. (2022). Effective teaching of electric circuit analysis through jigsaw cooperative learning method. *Journal of Engineering Education Transformations*, 36(1), 49-59. <https://doi.org/10.16920/jeet/2022/v36i1/22136>
- Slavin, R. (2005). *Cooperative learning: Theory, research, and practice*. Nusa Indah.
- Suparto, W. P., Yusmah, Y., Kasman, N., Amir, M., & Wafi, A. (2021). The application of collaborative writing strategy in teaching composition in a public junior high school. *ENGLISH FRANCA: Academic Journal of English Language and Education*, 5(2), 299. <https://doi.org/10.29240/ef.v5i2.3246>
- Udin, U., & Putera, L. J. (2022). How effective is implementing jigsaw IV in teaching reading of the narrative text to the eleventh-grade students? *Fondatia*, 6(2), 251-271. <https://doi.org/10.36088/fondatia.v6i2.1804>
- Walker, S., Olvet, D. M., & Chandran, L. (2015). The jigsaw technique of peer teaching and learning: An efficient and enjoyable teaching strategy in medicine. *MedEdPublish*. <https://doi.org/10.15694/mep.2015.006.0014>