JPPIPA 9(5) (2023)

Jurnal Penelitian Pendidikan IPA

Journal of Research in Science Education

http://jppipa.unram.ac.id/index.php/jppipa/index

Analysis of STEAM Content on the Module of Pancasila Student Profile Strengthening Project (P5) Based on Sasak Heritage

Iva Nurmawanti[1*], Nurwahidah[1], Setiani Novitasari[1], Anindita Suliya Hangesti Mandra Kusuma[2]

[1] Program Studi Pendidikan Guru Sekolah Dasar, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Mataram, Indonesia.
[2] Program Studi Pendidikan Biologi, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Mataram, Indonesia.

Received: March 10, 2023
Revised: May 15, 2023
Accepted: May 25, 2023
Published: May 31, 2023

Corresponding Author:
Setiani Novitasari
setianinovitasari@unram.ac.id

DOI: 10.29303/jppipa.v9i5.3966

Abstract: This study aims to analyze the STEAM content on the P5 module-based on Sasak Heritage. This research uses content analysis research and literature review. Content analysis was used to analyze the integration between STEAM and P5 in the modules that have been developed. Furthermore, this analysis was also strengthened by conducting a literature review on the STEAM topic from articles in international journals published starting in 2017-2022. The articles analyzed were 7 articles. The results obtained are that STEAM content at the P5 module stage can be made in 5 ways in implementing STEAM, namely by inter-discipline STEAM, several STEAM disciplines, as well as all STEAM disciplines at each stage of the planned project. STEAM integration can also be carried out starting at the basic education unit level with the application of P5.

Keywords: Merdeka Curriculum; P5; Sasak Heritage; STEAM

Introduction

The implementation of the Merdeka Curriculum is a change in the world of education to keep pace with the rapid changes in the current 21st century. The breakthrough regarding the Merdeka Curriculum aims to improve the quality of education in Indonesia so that the graduates produced can compete with the needs of the 21st century. Graduates in the 21st century must have 4C capabilities which include critical thinking, creative thinking, communication, and collaboration (Arsanti et al., 2021). In addition, character is also very important for students to have. Therefore, in the Merdeka Curriculum, graduate competence must have global competence and Pancasila character, which competence is accommodated in the Pancasila Student Profile. The Pancasila Profile contains piety to God Almighty, faith and noble character, mutual cooperation, critical thinking, independence, global diversity, and creativity.

One of the programs in the Merdeka Curriculum to achieve graduates who have the competency of the Pancasila Student Profile is the Pancasila Student Profile Strengthening Project(P5). The implementation of P5 has separate hours which are not integrated with other subjects but must still allocate time like regular learning (Cahyono, 2022). The implementation of P5 requires students to directly observe the surrounding environment while providing solutions related to the problems resulting from these observations. So it's not just a project based learning approach to classroom learning.

In order to achieve P5 optimally, the teacher must create a P5 module. Regarding the P5 module, teachers are not used to preparing P5 modules. The modules that have been provided by the Ministry of Education and Culture have also not been able to facilitate the need for implementing P5 in accordance with the conditions of the surrounding environment and the school. There are several studies related to the P5 module, including the

How to Cite:
Nurmawanti, I., Nurwahidah, N., Novitasari, S., & Kusuma, A.S.H.M. (2023). Analysis of STEAM Content on the Module of Pancasila Student Profile Strengthening Project (P5) Based on Sasak Heritage. *Jurnal Penelitian Pendidikan IPA*, *9*(5), 54–60. https://doi.org/10.29303/jppipa.v9i5.3966

P5 module based on local wisdom to increase the cultural literacy of high school students in Bogor. Nurwahidah et al. (2022) also developed modules based on P5 and Lombok culture specifically for elementary school students.

The implementation of P5 is also related to environmental problems that can be integrated with STEAM-based learning (Science, Technology, Engineering, and Mathematics). The integration of STEAM learning is very important in relation to supporting the achievement of global competencies and in accordance with the 21st century. Learning that integrates STEAM is very closely related to the lives around students, able to improve problem solving skills, creativity, and increase students' interest in STEAM (Perignat & Katz- Buonincontro, 2019). STEAM integration learning is also highly recommended for elementary level students, this can simultaneously explore their potential for STEAM to determine their future career starting early (Li et al., 2020). Therefore, it is important to integrate STEAM learning that goes hand in hand with the implementation of P5 in elementary school. Before the implementation is carried out the teacher needs to know how P5 relates to STEAM. Therefore, it is necessary to analyze the STEAM content in the P5 Module based on the Sasak Heritage Project which has been developed by Nurwahidah et al. (2022). The results of this study are expected to be able to provide an overview of how to integrate STEAM content in P5 for other topics. Therefore, this research is entitled "Analysis of STEAM Content on the Module of Pancasila Student Profile Strengthening Project (P5) Based on Sasak Heritage".

Method

This study uses a qualitative approach with a content analysis design. The content analyzed is STEAM content on the Sasak Herritage-based P5 module which has met valid and practical criteria. Research data on content analysis will be reported using descriptive analysis (Bozkurt et al., 2015). The data is obtained by analyzing the stages in the P5 module. 13 projects from the module will be analyzed. In each project, it will be analyzed what forms of activity reflect the contents of science, mathematics, technology, engineering, and art. Furthermore, the results of the analysis were compared with articles in international journals. The article must meet the criteria with the same theme and be published in 2021-2022. This is also a data triangulation process to check the validity of the data obtained. So that the data described is valid data. The articles analyzed are in the Table 1.

Table 1. List of Article Analysis

Author	Year	Title
Lyn D. English	2017	Advancing Elementary and Middle School STEM Education
Linda Hobbs, John Cripps Clark, and Barry Plant	2018	What Mathematics Education May Prepare Students for the Society of the Future?
Diego-Mantecon, J. M., Prodromou, T., Lavicza, Z., Blanco, T. F., & Ortiz-Laso, Z.	2021	An attempt to evaluate STEAM project-based instruction from a school mathematics perspective
Sullivan, A., & Strawhacker, A.	2021	Screen-Free STEAM: Low-Cost and Hands-on Approaches to Teaching Coding and Engineering to Young Children.
Kangas, K., Sormunen, K., & Korhonen, T.	2022	Creative Learning with Technologies in Young Students' STEAM Education
Lavicza, Z., Weinhandl, R., Prodromou, T., Anđić, B., Lieban, D., Hohenwarter, M., Fenyvesi, K., Brownell, C., & Diego-Mantecón, J. M.	2022	Developing and Evaluating Educational Innovations for STEAM Education in Rapidly Changing Digital Technology Environments.
Ng, A., Kewalramani, S., & Kidman, G.	2022	Integrating and navigating STEAM (inSTEAM) in early childhood education: An integrative review and inSTEAM conceptual framework

Result and Discussion

The P5 module was developed concerning the Merdeka Curriculum which was implemented in 140 thousand schools based on the Decree of the Head of the Education Standards, Curriculum and Assessment Agency (BSKAP) Number 044/H/KR/2022 (Elementary School Directorate, 2022). This module was created to support the achievement of P5 implementation. The implementation of P5 is a means to produce graduates who have a Pancasila Student Profile in accordance with the objectives of the Merdeka Curriculum.

Based on the Merdeka Curriculum document, it is known that there are seven themes to choose from in the development of P5. The seven themes cover a sustainable lifestyle, a voice of democracy, local wisdom, building body and soul, entrepreneurship, work culture, employment, and engineering and technology to build the Unitary State of the Republic of Indonesia (Kemendikbud, 2021). For the theme in Elementary School four themes can be applied in SD namely, 1) local wisdom, 2), sustainable lifestyle 3) engineering and

technology to build the Unitary State of the Republic of Indonesia, 4) Unity in Diversity. In the P5 module, the theme used is Local Wisdom. Local wisdom that is integrated with the module is Sasak Culture.

The dimensions of the P5 module based on Sasak Heritage are global diversity and creativity. Based on these dimensions, the elements chosen are knowing and appreciating the culture and generating original ideas. Integration of local culture in learning can improve the quality of learning (Yana et al., 2022). The sub-elements of knowing and appreciating culture are exploring culture and cultural identity and exploring and comparing cultural knowledge, beliefs, and practices. The achievement of dimensions, elements, and sub-elements in the P5 module is integrated with Sasak culture. The link is in the stages of the activities in this P5 Module. In more detail, the stages of activities in the P5 module are described as Figure 1.

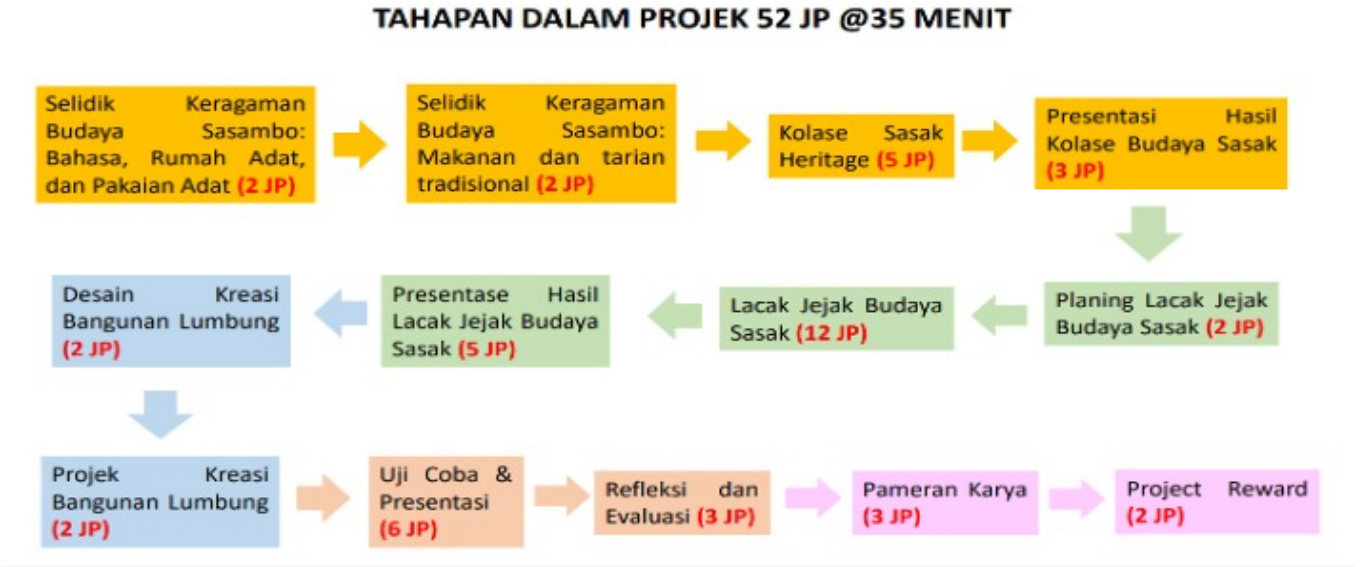

Figure 1. Project Stages in The Sasak Heritage Based P5 Module

The project stages in the P5 module based on Sasak Heritage include the introduction stage, the contextual stage, the action stage, the reflection stage and the follow-up stage. Activities to investigate the diversity of Sasambo Culture, Sasak Herritage Collage, and Presentation of the Results of Sasak Culture Collage are preparatory stages. The contextual stage includes tracking planning activities, tracking traces of Sasak Culture, and the percentage of trace results of Sasak Culture. The design activities for the creation of the granary building and the project for the creation of the granary building are the action stages. The reflection stage includes trials and presentations and reflection and evaluation. For the final stage, the follow-up stage includes work exhibitions and reward projects.

Figure 2. Stage of Sasambo Culture Investigation

The investigation activity on the cultural diversity of Sasambo aims to enable students to be able to identify the diversity of language, traditional clothes, and traditional houses of the Sasambo culture. In addition, students are expected to be able to describe the knowledge, faith, and practices of various cultural groups. Students are also expected to be able to identify the diversity of food and traditional dances of the Sasambo culture. Integrating learning by instilling local cultural values is expected to offset the negative impact of foreign culture (Syarif et al., 2016).

The investigation activities of Sasambo culture through research on the diversity of languages, traditional clothes, traditional houses, and Sasambo foods there is Science content from STEAM. Science can be seen from these inquiring activities students know about biodiversity which is used as the basic ingredient of Sasak cultural products. For example, in the traditional house of the Sasak culture, the roof used is made of natural materials, namely palm leaves. Students will investigate why palm leaves are used. Students will also know the process of science skills that are used by the community to dry the palm leaves so that they can be used for years. The process of science skills and knowledge of science is equally important in learning (Zimmerman, 2000). Learning science which emphasizes the development of science skills processes can be carried out with the STEAM approach to learning (Nutbrown, 2019).

In this Sasambo cultural investigation activity, there is also technology content from STEAM. Knowledge of how Sasak products are made is a technological content in STEAM. For example, regarding the technology used in the manufacture of traditional Sasak buildings made from natural materials, namely the pillars and the framework are all made of wood. There is a technology applied to joining these woods without using nails. This knowledge is the Technology content in the Sasak culture-based P5 Module. STEAM learning by engaging with digitization can create a fast-paced technology environment (Lavicza et al., 2022).

Figure 3. Stage of Sasak Haritage Collage

The goals achieved by students in the Sasak Heritage Collage Activity are that students are expected to be able to describe Sasak culture, develop ideas, and be imaginative to express an understanding of the diversity of Sasak culture in collages. Through this collage project activity, the technological content of STEAM is how the technology is used in gluing items that are made into collages. Technology is not always synonymous with tools and replaces the role of children's play, the use of blocks or puzzles is also technology in early childhood learning (Ng et al., 2022). In this collage activity, Art content also appears on how students consider beauty in composing collages. Integrating the arts in learning with other disciplines can instill the development of creativity and artistic expression starting at the early school level (Siciliano et al., 2019).

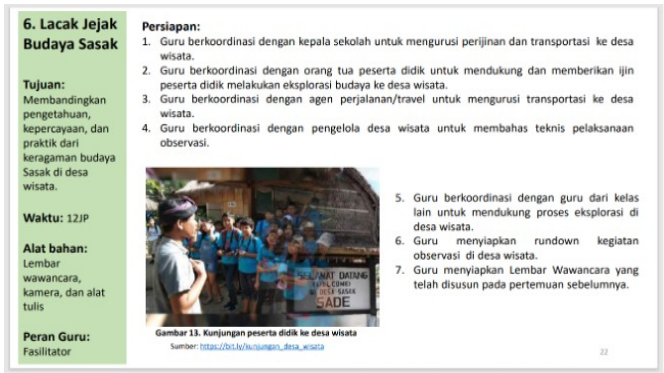

Figure 4. Trace of The Sasak Cultural Traces

The cultural tracing activity stage aims to enable students to compare knowledge, faith, and practices from the diversity of Sasak culture in tourist villages. So this activity was planned by inviting students to directly observe Sasak culture in tourist villages. In the Lombok area, there is a tourist village, namely Sade Village, Central Lombok. In this village, there are original buildings of the Sasak tribe, processing of Sasak weaving, typical crafts of the Sasak tribe, and so on. Science content at this stage students seek knowledge directly, for example, students can learn the scientific processes used to make Sasak buildings. The scientific process can also be known by processing natural materials into typical Sasak weaving. The integration of science learning with culture can significantly improve students' critical thinking skills (Verawati et al., 2022). At this stage, students learn about the technology used in making traditional Sasak houses, technology for making woven fabrics, and so on. Therefore, at this stage, students also learn technology directly. Students compare conventional technology and modern technology.

Figure 5. Lumbung Building Creation Design Stage

The next stage of the P5 module is Lumbung Building Creation Project. In this project, students were asked to make a miniature of the traditional Sasak building, namely the Lumbung, using straws. At this stage, the technological load is seen in the number of straws specified in the Lumbung building to determine its strength. The design of the Lumbung building by considering the strength of the building is an application of technology in STEAM learning. There are five technological dimensions in STEAM learning which include design, craft, documentation tools, engineering, and programming (Kangas et al., 2022). The process and method of combining straws to form straws is an implementation of the engineering content in STEAM. Through this activity, students can arrange to combine the straws by playing. There are basic engineering skills that students carry out in these activities. One example of basic engineering in STEAM that is carried out by elementary school children is when they play building a house, the process of them dismantling and assembling blocks into a house is an engineering process (Sullivan & Strawhacker, 2021).

Figure 6. Lumbung Building Creation Project Stage

The mathematical content at the stage of the Lumbung Building Creation Project can be seen from the process they carry out calculations from the designs they make. They will take into account how many straws to use in making the pole sturdy. If the straw has been used for the pole they will count how many straws can be used again. Of course, this requires calculations so that the design they make fulfills strong and beautiful elements. In the STEAM project about building Lego, the mathematical content is in the algorithm about building Lego and how many arrangements are possible using mathematical reasoning (Diego-Mantecon et al., 2021). There is also artistic content in this activity. In addition to the design of the building, the granary must be sturdy but also beautiful. There is an element of beauty that is adapted to the shape of the original Lumbung building. Art collaboration in projects related to the real world as STEAM projects can develop the abilities of students who can become generations who can contribute to the country in the future (Land, 2013).

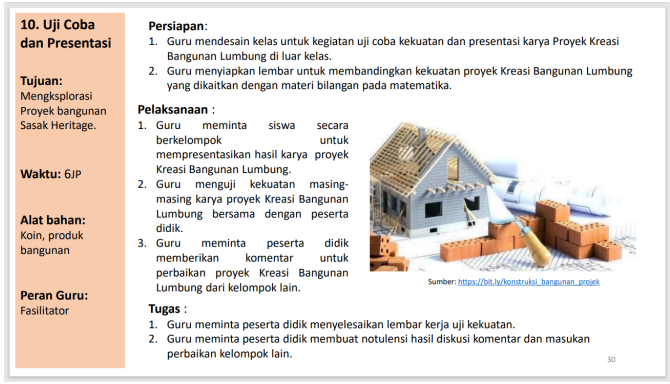

Figure 7. Building Test Stage

At the trial stage of the building made, there is mathematical content. Mathematics is in the process of counting coins to test the strength of the Granary building which has been assembled from straws. Students are also asked to compare which building is stronger based on the number of coins that the building can hold. So that in this activity students can distinguish which number is larger on the number line. For example, 8 is greater than 6, or 4 is less than 7. In STEAM projects, mathematics can be integrated into a transdisciplinary approach that includes mathematical content, formative assessment, and the development of thought processes that promote a positive attitude toward mathematics. (Diego-Mantecon et al., 2021).

Conclusion

P5 implementation on one topic can be carried out in several stages. At each stage of the Sasak Heritage Project, there is STEAM content. At the research stage of Sasambo Culture, there is STEAM content, namely science, and technology. Furthermore, at the Sasak Heritage College stage, there is STEAM content, namely technology, and art. As for the Sasak Culture Trace Track stage, the STEAM content is in science and technology. The STEAM content as a whole, including science, technology, engineering, and mathematics, is at the stage of the Sasak Building Creation Project. At the

design stage of the Sasak building, there is technology and engineering content. While at the product trial stage, there is mathematical content. Based on these results it can be concluded that STEAM in P5 can be implemented at project stages designed by implementing STEAM implementation types, namely inter-discipline STEAM, several STEAM disciplines, or all STEAM disciplines.

Acknowledgments
This work was supported by the Universitas Mataram under grant Number: 1740/UN18.L1/PP/2022. We would like to thanks for continuing support and feedback from colleagues in the faculties of education

Author Contributions
Iva Nurmawanti as the first author contributed to finding ideas, conducting research, and writing research articles. Nuwahidah as the second author contributed to collecting, processing, analyzing data, and writing articles. Setiani Novitasari as the third author contributed to the preparation of the instrument, collecting data, and writing articles. ASHM Kusuma as the fourth author contributed to designing the research and conducting the research.

Funding
External funding was provided by FKIP University of Mataram.

Conflicts of Interest
The authors declare no conflict of interest.

References

Arsanti, M., Zulaeha, I., Subiyantoro, S., & Haryati, N. (2021). *Tuntutan Kompetensi 4C Abad 21 dalam Pendidikan di Perguruan Tinggi untuk Menghadapi Era Society 5.0*. Prosiding Seminar Nasional Pascasarjana ISSN 26866404 Pascasarjana Universitas Negeri Semarang. Retrieved from http://pps.unnes.ac.id/prodi/prosiding-pascasarjana-unnes/

Bozkurt, A., Akgun-Ozbek, E., Yilmazel, S., Erdogdu, E., Ucar, H., Guler, E., Sezgin, S., Karadeniz, A., Sen-Ersoy, N., Goksel-Canbek, N., Dincer, G. D., Ari, S., & Aydin, C. H. (2015). Trends in distance education research: A content analysis of journals 2009-2013. *International Review of Research in Open and Distance Learning*, *16*(1), 330–363. https://doi.org/10.19173/irrodl.v16i1.1953

Cahyono, T. (2022). Implementasi Layanan Bimbingan dan Konseling dalam Penguatan Profil Pelajar Pancasila. *Prophetic: Professional, Empathy, Islamic …*, *5*(2), 125–134. https://www.jurnal.syekhnurjati.ac.id/index.php/prophetic/article/view/12782

Diego-Mantecon, J. M., Prodromou, T., Lavicza, Z., Blanco, T. F., & Ortiz-Laso, Z. (2021). An attempt to evaluate STEAM project-based instruction from a school mathematics perspective. *ZDM - Mathematics Education*, *53*(5), 1137–1148. https://doi.org/10.1007/s11858-021-01303-9

Kangas, K., Sormunen, K., & Korhonen, T. (2022). *Creative Learning with Technologies in Young Students' STEAM Education* (pp. 157–179). https://doi.org/10.1007/978-981-19-0568-1_9

Kemendikbud. (2021). *Panduan Pengembangan Projek Penguatan Profil Pelajar Pancasila dan Budaya Kerja*. Kemendikbud.

Land, M. H. (2013). Full STEAM ahead: The benefits of integrating the arts into STEM. *Procedia Computer Science*, *20*, 547–552. https://doi.org/10.1016/j.procs.2013.09.317

Lavicza, Z., Weinhandl, R., Prodromou, T., Anđić, B., Lieban, D., Hohenwarter, M., Fenyvesi, K., Brownell, C., & Diego-Mantecón, J. M. (2022). Developing and Evaluating Educational Innovations for STEAM Education in Rapidly Changing Digital Technology Environments. *Sustainability*, *14*(12), 7237. https://doi.org/10.3390/su14127237

Li, Y., Wang, K., Xiao, Y., Froyd, J. E., & Nite, S. B. (2020). Research and trends in STEM education: a systematic analysis of publicly funded projects. *International Journal of STEM Education*, *7*(1). https://doi.org/10.1186/s40594-020-00213-8

Ng, A., Kewalramani, S., & Kidman, G. (2022). Integrating and navigating STEAM (inSTEAM) in early childhood education: An integrative review and inSTEAM conceptual framework. *Eurasia Journal of Mathematics, Science and Technology Education*, *18*(7). https://doi.org/10.29333/ejmste/12174

Nurwahidah, N., Nurmawanti, I., Novitasari, S., & Kusuma, A. S. H. M. (2022). Development of STEAM-Based Learning Tools Based on the Sasak Heritage Project. *Jurnal Penelitian Pendidikan IPA*, *8*(6), 2900–2908. https://doi.org/10.29303/jppipa.v8i6.2550

Nutbrown, C. (2019). Play in Early Childhood Education and Care. In *Early Childhood Educational Research: International Perspectives*. https://doi.org/10.4135/9781526451811.n4

Perignat, E., & Katz-Buonincontro, J. (2019). STEAM in practice and research: An integrative literature review. *Thinking Skills and Creativity*, *31*, 31–43. https://doi.org/10.1016/j.tsc.2018.10.002

Siciliano, B., Khatib, O., Ferraguti, F., Villani, V., Sabattini, L., & Bonfè, M. (2019). *Springer Proceedings in Advanced Robotics Series Editors: Human-Friendly Robotics 2019 12th International Workshop*. http://www.springer.com/series/15556

Sullivan, A., & Strawhacker, A. (2021). Screen-Free STEAM: Low-Cost and Hands-on Approaches to Teaching Coding and Engineering to Young

Children. In *Embedding STEAM in Early Childhood Education and Care* (pp. 87–113). Springer International Publishing. https://doi.org/10.1007/978-3-030-65624-9_5

Syarif, E., Sumarmi, S., & Astina, I. K. (2016). Integrasi Nilai Budaya Etnis Bugis Makassar Dalam Proses Pembelajaran Sebagai Salah Satu Strategi Menghadapi Era Masyarakat Ekonomi Asean (MEA). *Jurnal Teori Dan Praksis Pembelajaran IPS*, *1*(1), 13–21. https://doi.org/10.17977/um022v1i12016p013

Verawati, N. N. S. P., Harjono, A., Wahyudi, & Gummah, S. (2022). Inquiry-Creative Learning Integrated with Ethnoscience: Efforts to Encourage Prospective Science Teachers' Critical Thinking in Indonesia. *International Journal of Learning, Teaching and Educational Research*, *21*(9), 232–248. https://doi.org/10.26803/ijlter.21.9.13

Yana, O. A. D., Ariyanto, P., & Huda, C. (2022). *Analisis Penguatan Dimensi Kreatif Profil Pelajar Pancasila Pada Fase B di SD Negeri 02 Kebondalem*. *4*, 1707–1715.

Zimmerman, C. (2000). The Development of Scientific Reasoning Skills. *Developmental Review*, *20*(1), 99–149. https://doi.org/10.1006/drev.1999.0497