The Validity of Problem-Based Collaborative Learning Model Books to Improve Students' Creative Thinking and Metacognitive Ability

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Abstract

Creative and metacognitive thinking are included in the realm of higher-order thinking which involves active control in cognitive processes to solve a problem. Various efforts to improve the mastery of creative thinking and metacognitive skills are needed, one of which is through the use of problem-based collaborative learning model books that stimulate students' creative and metacognitive thinking skills. This research uses research and development (R&D) methods and aims to test the validity of the problem-based collaborative learning model book. While the data collection using the questionnaire method. The book development uses the Plomp model, so the use of the book needs to be validated, in this case, the book was validated by three experts using V Aiken, the validation results showed content validity 0.919 by experts, construct validity 0.903 by experts with valid categories and can be used to determine the increase in thinking skills creative and metacognitive students. It is recommended for lecturers to apply a collaborative problem-based learning book model and emphasize creative thinking and metacognitive skills in the learning process.

Keywords
Book, Problem-Based Collaborative Learning Model, Creative and Metacognitive

1. Introduction

The process of human development cannot be separated from learning, in this learning process, a lot affects the individual character formed. Good learning can help individuals to achieve the objectives of the learning carried out such as the ability to construct the knowledge they have. However, in every learning carried out not everyone can construct their knowledge. Therefore, there needs to be a change in the teaching style of the teacher and the learning style of the students themselves. Various methods can be used as a reference for these changes, including the collaborative problem-based learning book model which is considered to be able to improve students' creative and metacognitive thinking skills (Nurmalina and Nina. Basuki 2019).

According to Panitz (1996) in (Mahmudi 2006), collaborative learning is defined as a learning method that makes collaboration the key to the success of a group in achieving common goals. The collaborative model is visualized in a group when collaboration occurs so that all students actively communicate naturally. Groups that have been determined by educators, which causes the facilities provided must provide children's collaboration competencies (Apriono, 2013). This learning model pays attention to each individual during the learning process with the hope that each individual can contribute to group work that is directed to work together by communicating with each other to solve a problem. This learning model directly hones students' skills to collaborate, practice good communication, express opinions, solve problems and improve creative and metacognitive thinking skills.

Johnson (2014) in (Darwanto 2019) explains that creative thinking is a habit of the mind that is usually trained in turning on various imaginations and intuitions, expressing new thoughts, looking at various points of view, and

getting new ideas. Creative thinking is also giving a touch of original ideas with new knowledge. So that creative thinking is not an organized thought and does not focus on logical processes, such as critical thinking. Seeing gaps, paradoxes, opportunities, and challenges that can seek meaningful relationships so that unusual possibilities arise and can develop or add to pre-existing possibilities, all of this includes creative thinking as well (Treffinger 2002) in (Mahanal and Zubaidah 2007).

While metacognitive thinking is the process of thinking about oneself which is the object of thinking. In the learning process, students know the learning process, then know the abilities they have. In addition, know the techniques in learning to realize effective learning. So that metacognition is the ability to see and examine one's abilities so that they know what is the solution to overcome them. Students with metacognitive knowledge will know their strengths and weaknesses, more core, namely the mistakes made, students can admit their shortcomings so they can try to fix them. Thus, an educator must strive to train students to have metacognitive abilities, so that students' ability to solve problems can increase. (Iskandar 2014).

According to Ismawati (2017) in (Sumarni 2019), the rapid development of this era requires each individual to have creative and metacognitive thinking so that by implementing this collaborative model students are expected to be able to explore through joint activities. Moreover, chemistry education students will find it easier to understand the material if the learning that is carried out can be done by connecting it to a really real situation so that it can arouse students' enthusiasm in increasing students' curiosity and interest in the learning process. In the end, students can analyze and assess activities that occur in everyday life.

Therefore, this research has a purpose, namely to test the validity of the collaborative problem-based learning book model to improve students' creative and metacognitive thinking skills. Then, the discussion in this article is related to collaborative learning theories, learning problems, and creative and metacognitive thinking.

2. Research Methods

The research method used is the research and development method (Research & Development). Research and Development research methods are research methods used to produce certain products and test the effectiveness of these products (Amile and Reesnes (2015) (Heckman 1967). So it can be concluded that to test the effectiveness of a product by going through several stages of validation and testing can be done with Research and Development research methods. With this research, researchers carry out system development and evaluation assessment of the system made with the data that has been collected.

The content validity of the instrument was obtained by giving a questionnaire to the three validators. The validity proposed by Aiken in 1985 was proven by standardization of validity which was influenced by the number of raters and the rating scale used (Bashooir 2018). In this study, the validation of the validity using the V Aiken formula, namely:

Information:

Vi = item validity index
s = r-l0
r = score given by validator for each item
l0 = minimum score (in this case l0=1)
n = number of validators
c = maximum score (in this case c =4)

In addition to content validation, the test also uses construct validity. According to Scarvia B. Anderson (Caturiyati, 2013) explains that a valid instrument is an instrument that can measure what it wants to measure. The need for validity testing is to measure the validity of an instrument. An instrument that has high validity will of course have a small measurement error, so the score obtained is not much different from the actual score. According to Suryabrata (2000) (Yusrizal, 2008), construct validity explains that the extent to which the score generated from a measurement with the instrument reflects the theoretical construct that underlies the preparation of the instrument. Connecting a measuring instrument with other measuring instruments that have theoretical similarities is an understanding of the process of testing construct validity (Murphy and Davidshofer 1991) (Ihsan 2015). The step in conducting the construct validity test is the factor analysis proposed by De Vaus (1991) in (Caturiyati 2013), namely: (1) selecting

the variables to be analyzed, (2) the initial extraction of a set of factors, (3) the final extraction of a set of factors with rotation, and (4) compiling a scale for further analysis.

While the research design used is the Plomp Model. Compared to other models, the Plomp Model is seen as more flexible and flexible. The Plomp model consists of five phases or 5 stages, namely: first, the preliminary investigation phase, this phase is one of the important elements in the design process, namely defining the problem. If the problem is a case of a discrepancy between what happened and the desired situation, then it is necessary to investigate the cause of the gap and describe it with great care. Second, the design phase (design) the solution phase (solution) designed from the definition of the problem. In this phase, it is designed to solve the problems proposed in the initial phase. The third phase of realization/construction (realization/construction) the realization of the previous phase. Fourth, the test, evaluation, and revision phase (test, evaluation, and revision) in this phase, a solution found must be tested and put into practice. The evaluation carried out is the process of collecting, processing, and analyzing information systematically, to obtain realizable value from existing solutions. Then lastly, implementation (implementation), this phase is done after evaluation and has obtained a valid product, practical, and its effectiveness, so that the product can be implemented in practice and the wider region (Irmawartini 2017).

3. Results And Discussion

Researchers researched a collaborative problem-based learning book model, the research was conducted using the Plomp model which was validated by three experts using V Aiken to know the improvement of students' creative and metacognitive thinking skills.

Table 1. Validity decision criteria based on Aiken's

interval	Category
V < 0.667	Invalid
V > 0.667	Valid

Determination of the criteria for interpretation of the validity of the learning module in Table 1 shows that the interval value less than 0.667 is declared invalid, while the value is more than 0.667 is declared valid.

Table 2. Results of the Content Validation book model by 3 validators

Indicator	Validator Rating			s	Validity Value	Average
	1	2	3			
The rationale for model development is clearly outlined	4	4	4	9	1	0.919
The suitability of the Collaborative Problem Based Learning (CPBL) model with cognitive theory	4	4	4	9	1	
The suitability of the Collaborative Problem Based Learning (CPBL) model with constructivism theory	4	4	4	9	1	
The stages of learning are arranged in an orderly and clear manner	4	4	3	8	0.889	
The learning stages contain the activities of lecturers and students	4	4	4	9	1	
The description of learning activities shows that there are student activities	4	4	3	8	0.889	
The description of learning activities shows the interaction between students and students	4	3	4	8	0.889	
The description of learning activities shows	4	4	4	9	1	

Indicator	Validator Rating			s	Validity Value	Average
	1	2	3			
the interaction between students and lecturers						
The description of learning activities shows the relevance of lecturer behavior in respecting student differences	4	4	3	8	0.889	
The description of learning activities shows that lecturers help students find their potential	3	4	3	7	0.778	
The description of the learning activities shows that the lecturer positions himself as a learning partner	4	4	3	8	0.889	
The description of learning activities shows that the lecturer guides students to carry out activities	4	4	4	9	1	
The description of learning activities shows that the lecturer provides activities that stimulate students' curiosity and encourage students to explore ideas and communicate scientifically	4	4	3	8	0.889	
The description of learning activities shows that the lecturer motivates students to ask questions and express opinions	3	4	4	8	0.889	
Learning devices are arranged according to the steps of the learning model	4	4	3	8	0.889	
Learning devices are arranged according to learning objectives	4	4	3	8	0.889	
The type of instructional impact is stated clearly and logically at the syntax learning stage	3	4	3	7	0.778	
The types of accompaniment effects are stated clearly and logically at the learning stage in syntax	4	4	4	9	1	

The results of the study in Table 2 show the results of the content validation book model by 3 validators with the highest validity value of 0.889, the lowest validity value of 0.778, and the average validity value of 0.919.

Table 3. Results of the Construct Validation book model by 3 validators

Indicator	Validator Rating			s	Validity Value	Average
	1	2	3			
The suitability between the stages of the learning model and the learning objectives to be achieved is not contradictory	4	4	4	9	1	0.903
Relationship between supporting theory and learning characteristics	4	4	4	9	1	
Understand the principles of supporting theory with learning objectives and characteristics	4	3	3	7	0.778	
The linkage of each stage of the learning model internally supports each other	4	4	3	8	0.889	

Indicator	Validator Rating			s	Validity Value	Average
	1	2	3			
The activities of students and lecturers at each stage of learning in the learning model are interrelated	4	4	4	9	1	
The use of learning resources for the achievement of learning objectives is mutually supportive.	3	4	4	8	0.889	
The pattern of interaction between students and lecturers who support each other.	3	4	3	7	0.778	
The behavior of lecturers in providing motivation and guidance to students is reflected in the stages of the learning model.	4	4	3	8	0.889	

The results of book validation for constructs by 3 validators in Table 3 are known that the lowest validity value is 0.778, the highest validity value is 0.889 and the average validity value is 0.903.

Based on the results of the study, the validity of the Problem-Based Learning Collaborative Book Model to Improve Students' Creative Thinking and Metacognitive Ability. The results of the validation of the contents of the book by 3 validators have an average value of 0.919 which is declared as valid because it is more than 0.667 following the criteria for interpreting the validity of the learning module. Meanwhile, the results of the Construct Validation book model by 3 validators have an average value of 0.903 which is declared as valid because it is more than 0.667 following the criteria for interpreting the validity of the learning module.

So that the problem-based collaborative learning model book is declared valid to improve students' creative and metacognitive thinking skills. Collaborative learning has many positive benefits such as training in respecting diversity and individual differences (Mahmudi 2006). Collaborative learning teaches students to work together with people who have different characteristics and have different views. Then discussing in small groups can improve and convey the ideas they have. However, this cannot happen in a classical class. Collaborative learning can also improve and enhance interpersonal skills that are indispensable in everyday interactions.

Elizabert E. in Barkley in his book Collaborative Learning Techniques (Fahmi 2015) suggests that collaborating means working together with other people. Likewise, in the practice of collaborative learning, it means working with other people or in small groups to achieve the learning goals to be achieved. Collaborative learning means working together not alone. Collaborative learning is referred to in this refers to the creation of an environment in which students can learn, help each other and teach material that is being discussed, as well as working together to complete a task group. With such, the group must have a clear structure or even be better to submit options to the students themselves to choose and approve thestructure that willbeused (Hidayah 2021).

Life is not far from problems as well as this learning model requires us to develop the ability to solve problems that occur in real life (Mudrikah 2019). A conducive, open, negotiated, and democratic situation that must always be maintained. According to Duch (1995) in Aris Shoimin (2014) suggests that the notion of the Problem Based Learning model is: Problem Based Learning (PBL) or problem-based learning is a learning model that has the characteristics of having real problems for students' learning tools to think critically and solve problems and gain knowledge (Soesatyo 2017).

Much collaborative learning has been developed by experts who are experienced, but ten kinds of learning are gaining attention (attention) and effort (effort), namely: Learning Together (Learning together), which means students are required to have the ability to work in groups. Each group works together to complete the assigned task. So that the assessment is based on work done in groups. Teams Games Tournament (TGT), which is a learning model carried out with team tournaments. Each group will compete with other groups according to their abilities. Group Investigation (GI) is a learning model that trains the ability to think independently. Academic Constructivism Controversy (ACC), is a learning model that prioritizes the process in achieving it and developing

quality in solving the problems encountered. Jigsaw Procedure (JP), which is a learning model in which each group is given a different task about one material with the aim that the whole group can understand the material well. The assessment is based on the group's average score. Student Team Achievement Divisions (STAD) is a learning model that focuses on the individual success that affects group success and vice versa. Complex Instruction (CI) is a learning method that emphasizes the process of implementing a finding-oriented project, especially in the fields of science, mathematics, and social knowledge (Maulidiyah 2020).

The Problem Based Learning learning model has five characteristics that distinguish it from other learning models, namely: Learning is student-centered, namely the learning process that is centered on students. Then the theory of constructivism is to develop knowledge with various activities carried out. Authentic problems from the organizing focus for learning, problems are given to students are authentic problems so that they are easily understood and applied by students. New information is acquired through self-directed learning, where students try to find their way of solving the problem. Learning occurs in small groups, small groups to exchange ideas in developing knowledge, groups that are created to demand a clear division of tasks and goals. Teachers act as facilitators, teachers only act as facilitators, although teachers must monitor, and encourage students in carrying out their duties (Badiklat Denpasar, 2020). Meanwhile, according to Abbas et al. (2019) in (R Hidayah 2021) states that the characteristics of collaborative learning include Interaction, Positive Dependence, Interpersonal Skill Development, Individual or Group Accountability, Knowledge Sharing Between Teachers and Students, Formation of Heterogeneous Groups, Teachers as Mediators, Sharing Authority Between Teachers and Students Student.

Collaborative learning requires working principles because the principles that are important and need to be considered are as follows. 1) each group member in collaborative learning works together to achieve common goals and has a sense of interdependence; 2) each individual has a sense of responsibility based on his learning and behavior; 3) cooperative skills are taught, then practiced and there must be feedback as to how well the skill exercises are applied; and 4) groups are encouraged to implement cohesive group work activities (Margunayasa, 2020).

Collaborative learning provided must begin with giving problems to students/students for them to solve, the problems given have been selected so that they can "guide" and challenge students/students to gain understanding/rules/principles/concepts/formulas/algorithms. , or increase understanding, reasoning, communication, connection, representation, and also problem-solving abilities (Djamilah 2008).

Puccio & Murdock (1999) in (Milyawato 2013) explain that creative thinking has two aspects, namely cognitive aspects and metacognitive aspects. Included in the metacognitive process include: developing techniques, determining goals and decisions, estimating from incomplete data, understanding what others do not understand, predicting incomplete information, making other paths, regulating emotions, and advancing the elaboration of problem solutions and plans. . So that students can think creatively who tend to do metacognition in the learning that is carried out.

(Redjeki, 2021) explains that metacognition is a process of growing interest because someone carries out cognitive processes to reflect on their cognitive processes. This metacognition is very important because knowledge will guide students in compiling and choosing ways to improve positive performance. Most students will rethink the answers they get because they feel there is any inconsistency between the question and the answer or feel dissatisfied with the answers given so that they require the steps that have been passed.

Students who want to have the habit of creative thinking must also get used to learning to solve problems, which can help in this case is a learning model that can be applied in the classroom, namely the problem-based learning model. This learning model can help students think independently in solving chemical problems (Krestiwi 2015).

The collaborative problem-based learning (CPBL) model has several systematic stages so that it can train students to find problems and find solutions collaboratively. Improving collaboration skills can be done in the experimental class of the learning process that begins with an orientation to get a solution. Learning orientation can be done to train students in compromising in determining the tasks of each group member and then practicing self-responsibility from the given task. Then, practice teamwork skills and compromise in solving problems encountered by brainstorming discussions among group members through analysis activities and determining

information. Another thing that can improve collaboration skills is communication exercises. Students can convey ideas when designing and have a way of presenting the work presented (Ilmiyatni 2019).

Collaborative learning makes students contribute in groups so that together they find solutions to existing problems. In line with what was stated by (Nunuk Suryani 2010) explaining that collaboration occurs between individuals and groups, who respect each other in achieving common goals. Collaborative skills can also help improve the development of ideas in exchanging ideas and information to find creative solutions in completing tasks whose success depends on how often they interact.

Some of the benefits can be obtained from collaborative learning. The following are the benefits of collaborative learning according to Hill & Hill (1993) learning achievement increases; 2) deeper understanding; 3) learning will be fun; 4) improve leadership skills; 5) increase positive attitude; 6) increase self-esteem; 7) inclusive learning; 8) feeling of belonging to each other; and 9) developing future skills (Nunuk Suryani, 2010). Apart from the benefits, of course, collaborative learning has its drawbacks. It can be realized that the success of cooperative learning is determined by several conditions (Nunuk Suryani, 2010).

According to (Sudjana 2006) in (Yulia 2019) the application of the PBL learning model can increase student activity, because students are required to seek, find, and analyze the problem-solving process. Then, PBL can also make students' skills increase because students are encouraged to express their opinions or ideas in solving problems to find solutions to existing problems (Arends 2008; Nafiah 2017). It can be concluded that the activeness and social skills of students can be increased by using the PBL model through its learning syntax, namely finding problems, research and investigations, presenting the results of discussions, and analyzing the problem-solving process (Siswanti and Harjono 2019).

In another study regarding the use of PBL in improving critical thinking skills by (Desi Nuzul Agnafia 2019) it was found that students' critical thinking skills increased after the implementation of the PBL model. Critical thinking skills can be improved through PBL because of the learning approach to authentic problems, and students are not only asked to understand the problem but are required to work together to solve the problem. Furthermore, students can stimulate their abilities and skills in critical thinking (Masrinah 2019).

The cognitive constructivist theory by Piaget states that students of all ages are actively involved in the process of processing knowledge and constructing knowledge (Arends 2012). Students will have the ability to think critically, problem-solve by starting cooperatively and then students will be able to solve their problems. The social constructivist view by Vygotsky, states that interactions with other individuals can construct a shared understanding that cannot be built personally (Moreno 2010). Critical thinking, problem-solving, collaboration were developed with modified Problem Based Learning (PBL) and Collaborative Learning models. PBL is used to hone the ability to investigate and have critical thinking, problem-solving, and social skills per adult behavior, independent abilities (Skinner et al. 2015). The collaborative problem-based learning model has a goal to solve problems collaboratively.

The research of Hesse et al. (2015) found that collaborative problem-solving activities can be successful if there is an interaction between group members. The results of the research above indicate that innovation is still needed for the PBL model and the CL model which are specifically developed to improve critical thinking, problem-solving and collaborative skills. CPBL is used to improve students' creative and metacognitive thinking skills as follows.

1. Students have creative thinking through observing, analyzing, providing problem-solving in real life, and being creative in responding to all problems. Walter (2005) states that creative thinking skills are a stage in obtaining information by solving problems cooperatively. The ability to think creatively focuses on learning activities by involving several activities, analyzing, synthesizing, making guesses, making something new, and implementing the information obtained in real terms. Students can develop creative ideas, appreciate various products of imagination, and see mistakes as a process leading to success in learning (Blascova 2014).
2. Students can collaborate in a team with peers to solve problems. Care and Griffin (2014) state that collaborative is an approach by combining cognitive and social abilities in problem-solving through teamwork. According to Mercier and Higgins (2014) collaborative can foster the ability to collaborate in solving problems. Social ability is a person's ability together to share tasks in solving problems.
3. Students can solve problems that occur in their environment by conducting investigations. Problem-solving is a planned process with the following steps: understanding the problem, identifying the characteristics of the

problem, determining hypotheses to solve the problem, testing different hypotheses, and selecting appropriate alternatives (Moreno 2010).

4. Metacognition ability expects students to be able to make decisions that are careful, systematic, logical, and precise (Setiawan et al. 2013). Thus, it is very necessary to empower metacognitive abilities to students, especially to students who are considered agents of change. In addition, metacognitive abilities which are 21st-century abilities also still support the four pillars of life, namely learning to know, learning to do, learning to be, and learning to live together (Zubaidah 2016).

4. Conclusion

Creative and metacognitive thinking can be improved through the collaborative problem-based learning (CPBL) model because with this CPBL model students are required to convey ideas and ideas from orientation, finding problems, to finding solutions. Then with critical thinking coupled with collaborative learning, it is hoped that they can explore together. The application of this model helps chemistry education students understand the material which can then convey learning to students by generating enthusiasm, curiosity, and interest in students in the teaching and learning process.

References

Agnafia., D. N., Analisis Kemampuan Berpikir Kritis Siswa Dalam Pembelajaran Biologi Desi, *Florea*, vol. 6, no. 5, pp. 55, 2019.

Apriono, D., Pembelajaran Kolaboratif: Suatu Landasan Untuk Membangun Kebersamaan Dan Keterampilan Kerjasama, *Fkip Universitas Pgri Ronggo Lawe Tuban*, *September*, pp. 60–70, 2013.

Bashooir, K. S.,Validitas Dan Reliabilitas Instrumen Asesmen Kinerja Literasi Sains Pelajaran Fisika Berbasis Stem, *Jurnal Penelitian Dan Evaluasi Pendidikan*, vol. 22, no. 2, pp. 168–181, 2018. Https://Doi.Org/10.21831/Pep.V22i2.20270

Caturiyati, K. H. Dan, Validitas Konstruk (Construct Validity) Dalam Pengembangan Instrumen Penilaian Non-Kognitif, *Journal Of Chemical Information And Modeling*, vol. 53, no. 9, pp. 1689–1699, 2013.

Darwanto., Kemampuan Berpikir Kreatif Matematis (Pengertian Dan Indikatornya) Darwanto, *Jurnal Eksponen*, vol. 9, no. 2, pp. 20–26, 2019.

Denpasar, B., *Model Problem Based Learning*, Kementerian Agama, 2020. Https://Bdkdenpasar.Kemenag.Go.Id/Berita/Model-Problem-Based-Learning

Fahmi, Collaboration Learning, *Institut Agama Islam Kendari*, pp. 21–53, 2015.

Heckman, J. J., Pinto, R. and Savelyev, P. A. (Bab 3), Penelitian R&D, *Angewandte Chemie International Edition,* vol. 6, no. 11, pp. 951–952, 1967.

Hidayah, R. and F Fajaroh, R. N., Pengembangan Model Pembelajaran Collaborative Problem Based Learning Pada Pembelajaran Kimia Di Perguruan Tinggi, *Qalamuna: Jurnal Pendidikan, Sosial, Dan Agama*, vol. 13, no. 2, pp. 50, 2021.

Hidayah, R., Fajaroh, F. and P Parlan, I. D., Collaborative Problem Based Learning Model For Creative Thinking Ability, *Journal Of Asian Multicultural Research For Educational Study*, vol. 2, no. 2, pp. *24*-30, 2021.

Ihsan, H., Validitas Isi Alat Uukur Penelitian: Konsep Dan Panduan Penilaiannya, *Pedagogia Jurnal Ilmu Pendidikan*, vol. 13, no. 3, pp. 173, 2015. Https://Doi.Org/10.17509/Pedagogia.V13i3.6004

Ilmiyatni, F., Jalmo, T. And Yolida, B., Pengaruh Problem Based Learning Terhadap Keterampilan Kolaborasi Dan Berpikir Tingkat Tinggi, *Jurnal Bioterdidik*, vol. 7, no. 2, pp. 35–45, 2019.

Irmawartini, Metodologi Penelitian: Metodologi Penelitian Skripsi, *Rake Sarasin*, pp. 1–36, 2017. Http://Bppsdmk.Kemkes.Go.Id/Pusdiksdmk/Wp-Content/Uploads/2017/11/Daftar-Isi-Metodologi-Penelitian_K1_Restu.Pdf

Iskandar, S. M., Pendekatan Keterampilan Metakognitif Dalam Pembelajaran Sains Di Kelas, *Erudio Journal Of Educational Innovation*, vol. 2, no. 2, pp. 13–20, 2014. https://Doi.Org/10.18551/Erudio.2-2.3

Krestiwi, K., Pengaruh Model Pembelajaran Berbasis Masalah Listrik Dinamis, *Universitas Negeri Jakarta*, vol. 3, no. 1, pp. 245–252, 2015.

Mahanal, S. and Zubaidah, S., Model Pembelajaran Ricosre Yang Berpotensi Memberdayakan Keterampilan Berpikir Kreatif, *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, vol. 2, no. 5, pp. 676–685, 2017. http://Journal.Um.Ac.Id/Index.Php/Jptpp/Article/View/9180

Mahmudi, A., Pembelajaran Kolaboratif [Collaborative Learning], *Fakultas Matematika Ilmu Pengetahuan Alam Universitas Yogyakarta*, pp. 1–11, 2006. http://Eprints.Uny.Ac.Id/11996/1/Pm - 57 Ali Mahmudi.Pdf

Margunayasa, I. G., Japa, I. G. N. and Kusmariyatni, N. N., Membangun Learning Community Melalui

Pembelajaran Kolaboratif Berbasis Lesson Study Di Sdn 3 Tegallinggah, *Lppm.Undiksha.Ac.Id*, pp. 1871–1880, 2020. Https://Lppm.Undiksha.Ac.Id/Senadimas2020/Assets/Prosidingsenadimas2020/File/259.Pdf

Masrinah, E. N., Aripin, I. and Gaffar, A. A., *Problem Based Learning (Pbl) Untuk Meningkatkan*, pp. 924–932, 2019.

Maulidiyah, I., *Model Pembelajaran Kolaborasi (Collaborative Learning)*, Kompasiana, 2020. Https://Www.Kompasiana.Com/Izadatulm/5fce3a4dd541df3f23244eb2/Model-Pembelajaran-Kolaborasi-Collaborative-Learning

Milyawato, B., Membangun Budaya Self Regulated Learning And Mathematical Thinking Dalam Menyongsong Implementasi Kurikulum 2013, *Jurnal, Biormatika Fkip, Ilmiah Subang, Universitas Kurikulum, Implementasi Kunci, Kata*, 1–16, 2013.

Mudrikah, A., Problem Based Learning As Part Of Student-Centered Learning. *Social, Humanities, And Education Studies (Shes): Conference Series*, vol. 1, no. 4, pp. 105–112, 2019.

Nafiah, Y. N., Penerapan Model Pbm Untuk Meningkatkan Kinerja Dan Kemampuan Berpikir Kritis Siswa Sma. *Jurnal Pendidikan Vokasi*, vol. 1, no. 1, pp. 45–53, 2017. https://Doi.Org/10.33369/Diklabio.1.1.45-53

Nurmalina, N., Basuki, A. I. S., Model Kolaboratif Berbasis Masalah Untuk Pengembangan Keterampilan Sosial Siswa Sekolah Dasar, *Universitas Negeri Malang*, vol. 3, no. 2, pp. 40–46, 2019.

Pramusinta, Y., Efektivitas Metode Problem Based Learning Dalam Meningkatkan Keaktifan Siswa Mi Tarbiyatul Athfal Babat, *Jurnal Pendidikan Guru Madrasah Ibtidaiyah Volume*, vol. 3, no. 1, pp. 103–111, 2019.

Redjeki, S., *Analisis Berbagai Strategi Dan Model Pembelajaran Yang Dapat Memberdayakan Kemampuan Metakognitif Pada Pembelajaran Biologi*, vol. 9, no. 2, pp. 30–40, 2021.

Siswanti, R., and Harjono, N., Penerapan Model Pembelajaran Problem Based Learning Untuk Meningkatkan Keaktifan Dan Hasil Belajar Matematika Siswa Sd, *Maju: Jurnal Ilmiah Pendidikan*, pp. 281–288, 2019. Https://Ejournal.Stkipbbm.Ac.Id/Index.Php/Mtk/Article/View/306

Soesatyo, Y., Tjipto Subroto, W., Canda Sakti, N., Edwar, M. and Trisnawati, N., Pelatihan Penulisan Proposal Penelitian Tindakan Kelas (Ptk) Bagi Guru Ekonomi Kabupaten Sidoarjo, *Jurnal Pemberdayaan Masyarakat Madani (Jpmm)*, vol. 1, no. 2, pp. 162–178, 2017. Https://Doi.Org/10.21009/Jpmm.001.2.02

Sumarni, W., Wijayati, N. and Supanti, S., Kemampuan Kognitif Dan Berpikir Kreatif Siswa Melalui Pembelajaran Berbasis Proyek Berpendekatan Stem, *J-Pek (Jurnal Pembelajaran Kimia)*, vol. 4, no. 1, pp. 18–30, 2019. Https://Doi.Org/10.17977/Um026v4i12019p018

Suryani, N., Implementasi Model Pembelajaran Kolaboratif Untuk Meningkatkan Ketrampilan Sosial Siswa, *Majalah Ilmiah Pembelajaran*, vol. 8, no. 2, 2010.

Widjajanti., D. B., Dari Bruner, Yang Menekankan Pentingnya Interaksi Sosial Untuk Membantu Siswa Memperoleh Tingkat Pemahaman Yang Lebih Tinggi. Belajar ”Melampaui Batas Dan Melompat” Dengan Bantuan Teman Dan Guru, Adalah Konsep Zpd Dan, *Fakultas Matematika Ilmu Pengetahuan Alam Universitas Yogyakarta*, vol. 5, pp. 101–110, 2018.

Yusrizal, Pengujian Validitas Konstruk Dengan Menggunakan Analisis Faktor, *Jurnal Tabularasa Pps Unimed*, vol. 5, no. 1, pp. 1–20, 2018.

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