Application of MURDER Collaborative Learning and Achievement Motivation on Problem-Solving Skills

Wiwin Andriani[a], Punaji Setyosari[b], Dedi Kuswandi[c], Waras Kamdi[d], Wawan Gunawan[e], Hari Karyono[f], [a,b,c,d]Graduate Student, Universitas Negeri Malang, [e,f]Indonesia, Universitas PGRI Adibuana Surabaya, Indonesia, Email: [a]wiwinandriani3646@gmail.com, [b]punaji.setyosari.fip@um.ac.id, [c]dedi.kuswandi.fip@um.ac.id, [d]waras.ft@um.ac.id, [e]wawan.gunawan@unipasby.ac.id, [f]harikaryana@yahoo.com

This study aims to examine the collaborative effect of the MURDER (mood, understand, recall, detect, elaborate, and review) learning strategy and achievement motivation on the learning outcomes of problem-solving skills. This research uses a quasi-experimental design method supported by a two-factor factorial design. The research instrument contained several questionnaires to measure achievement motivation, and test questions to measure problem solving. The data analysis techniques were processed using the analysis of variance (ANOVA) method. The results showed that, firstly, there was a significant difference in the results of the problem solving learning outcomes between the groups of students who used the MURDER collaborative learning strategy, and the groups of students who used conventional learning strategies. This is due to the fact that the application of the MURDER collaborative learning strategy is better at improving the learning outcomes of problem solving compared to those applying conventional learning strategies. Secondly, there was a significant difference in the results of learning problem solving between the groups of students who had high achievement motivation, and the groups of students who had low achievement motivation. This is due to the fact that the groups of students who have high achievement motivation can improve the learning outcomes of problem solving when compared to the groups of students who have low achievement motivation. Third, and lastly, there is an interaction between MURDER collaborative learning strategies, as well as conventional learning strategies, and the achievement motivation towards the results of learning how to problem solve. This means that

together MURDER collaborative learning strategies, and achievement motivation affect the learning outcomes of problem solving.

Keywords: *MURDER collaborative learning, Achievement motivation, Problem solving learning outcomes.*

Introduction

Learning activities or practices are designed with the aim of facilitating students to achieve a certain competency or learning goal (Gunawan W, Degeng INS, Utaya S, 2019). Learning objectives ideally reflect the knowledge, attitudes, and skills that can be obtained by students after going through the learning process (Wardani, Setyosari, & Husna, 2019). Effective learning is usually characterised and measured by the level of goal attainment by most students. This achievement average demonstrates that a number of learning experiences can be accepted by students internally (Fadhli, Brick, Setyosari, Ulfa, & Kuswandi, 2020). However, the problem, which is faced at school, and at university today, is how to encourage students to better utilise their problem-solving skills through learning. Students need problem-solving skills so that they really comprehend and do not just memorise or know information (Santoso, 2015). The problem-solving skill is not only influenced by learning strategies, but also factors that come from students. The factors that exist in students include the level of student intelligence, initial skill, attitudes, talents, interests, and motivation for student achievement (Oktiani, 2017).

One of the subjects in the material development of students who require problem-solving skills is the nature of the growth and development of students. This is supported by the results of observations in class, which show that the average UTS score in the material development of students is lower when compared to the previous semester. The results of the UTS absorption evaluation results in the 2018 school year show that the average value of the development of students is lower than other material, with a value of 58.3. The difficulty of students in understanding their development materials is also supported by findings in research conducted by Mahanani and Budi Murtiyasa (2016), Prastiti (2009), and Sappaile and Pristiwaluyo (2019). Student development material contains basic competencies that require problem-solving skills.

To be able to develop students' problem-solving skills for the better, a collaborative learning strategy is needed. One way to improve the learning process and learning outcomes of students is through collaborative learning strategies (Dian Anggreni, Margunayasa, & Kusmariyatni, 2019; Sugiman, Retnowati, Ayres, & Murdanu, 2019). However, in its development, the application of collaborative learning strategies is still not optimal in overcoming these problems. This is also supported by changes in the curriculum demands that lead to learning. Often, learning, in its implementation in class, takes time for the process of finding

information, even though the material for student development is very dense. For this reason, the MURDER — mood, understand, recall, detect, elaborate, and review — learning strategy is needed, so that the learning process can be more effective and efficient (Iptihani & Lutfi, 2019; Nikmah, 2014; Nuryanti, 2016).

The application of a MURDER strategy, which is individualised, requires the teacher's active role in guiding all students in the class (Masela & Marasabessy, 2016). This becomes an obstacle to the learning process because learning will become less efficient and effective. For this reason, collaborative learning is needed, which involves all students to help one another in groups or in pairs. The students who attend class need the most efficient collaborative learning model in their formation. One of the collaborative learning methods that can be used is the MURDER strategy. The success of MURDER type learning in improving the problem-solving skills and learning outcomes of students' development is shown by several previous studies. One of them, is that the MURDER learning strategy is effective in improving student learning outcomes (Anggraini, Wendra, & Putrayasa, 2017; Warouw, Hadjar, & Hamid, 2016). This motivates the researcher to want to analyse the differences in the students' problem-solving skills. This is undertaken through collaborative learning strategies that are integrated into the MURDER learning format upon students' developmental material, and in terms of student achievement motivation.

Method

This study uses a quasi-experimental method with a two-factor factorial design, which is the experimental group, and the control group. The subjects of this study were 2019 students from the A, B, C, and D English Language Study Program classes, which totalled 97 students, already in the form of intact groups. The sampling was performed with the cluster sampling technique to randomly select all the subjects of the study — students in classes A, B, C, and D — and choose the experimental class, and the control class. The experiment, and control classes were carried out by a lottery technique. In the first stage, four groups or classes were randomly selected as research subjects, and in the second stage, the lottery technique determined two classes as the experimental class, and two classes as the control class.

This study uses two learning strategies: MURDER collaborative learning, and conventional learning. Thus, there are two treatment groups in this study. The first group was given the MURDER collaborative learning treatment, and the second group was given the conventional learning treatment. The design in each group is different but uses the same time allocation.

The variables of this study consisted of: the independent variable of MURDER collaborative learning, the dependent variable of problem solving learning outcomes, the moderator variable of pretending motivation, and the control variable of conventional learning strategies. In this

research instrument there are several questionnaires which are used to measure achievement motivation, and test questions to measure problem solving.

The data is ready to be processed with the analysis of variance (ANOVA) technique. As the data requires for parametric statistical tests, the ANOVA will be developed from the parametric assumptions, as follows: the sample must be normally distributed; the resulting variant value data must be homogeneous or the assumption of homogeneity; the data processed must be interval and ratio scales; and the research samples must be taken randomly.

Results
Normality Test Results

The following are the results of the normality test on the variables of the pre-test of learning achievement, the post-test of learning achievement, and the problem-solving based on factors of the experimental group, and the control group. The method used in the normality test was the Kolmogorov-Smirnov test. The normality test results are presented in Table 1 below.

Table 1: Normality Test Results

Variable	Group	Kolmogorov-Smirnov			Ket.
		Statistic	**df**	**Sig.**	
Pre-test problem-solving skills	Experiment	0.117	45	0.145	Normal
	Control	0.119	52	0.064	Normal
Post-test problem-solving skills	Experiment	0.089	45	0.200	Normal
	Control	0.121	52	0.055	Normal

Source: Processed Research Data (2020).

The results of the normality test with the Kolmogorov-Smirnov test on the variable pre-test the problem-solving skills of the groups of students who used the MURDER collaborative learning method — the experiment group. These students obtained a Kolmogorov-Smirnov coefficient of 0.117, with a significance value of 0.145. Therefore, the significance value is greater than 0.05 (0.145> 0.05), so it can be concluded that it meets the normal requirements. Meanwhile, in the group of students who used the conventional learning method — the control group — the Kolmogorov-Smirnov coefficient value was 0.119, with a significance value of 0.064. Therefore, the Significance value is greater than 0.05 (0.064> 0.05), so it can be concluded that it meets the normal requirements.

In the post-test variable, the problem-solving skills of the groups of students who used the MURDER collaborative learning method obtained a Kolmogorov-Smirnov coefficient value of 0.089, with a significance value of 0.200. Therefore, the significance value is greater than 0.05 (0.200> 0.05), so it can be concluded that it meets the normal requirements. Whereas, in the

group of students who used the conventional learning method, the Kolmogorov-Smirnov coefficient value was 0.121, with a significance value of 0.055. Therefore, the significance value is greater than 0.05 (0.055> 0.05), so it can be concluded that it meets the normal requirements. Overall, it can be said that all the data groups involved in the analysis were proven to meet the normal requirements.

Homogeneity Test Results

The following are the results of various homogeneity tests conducted on the variables of the pre-achievement of learning, post-achievement of learning achievement, and problem-solving, which were based on factors of the experimental group, and the control group. The method used in the normality test was the Levene's test.

Table 2: Results of Variety Homogeneity Tests

Variable	F	df1	df2	P	Ket.
Pre-test problem-solving skills	0.065	3	93	0.978	Homogeneity
Post-test problem-solving skills	1.732	3	93	0.166	Homogeneity

Source: Processed Research Data (2020).

Table 2 presents the results of the homogeneity test of variance with the Levene's test on the variable of the problem-solving skills, post-test of the problem-solving skill. For the pre-test variable, the problem-solving skills obtained the coefficient of homogeneity of variance (F) of 0.065, with a significance value of 0.978. Consequently, as the significance is greater than 0.05 (0.978> 0.05), it can be concluded that the pre-test variable of the problem-solving skills meets the homogeneous requirements.

For the post-test variable, the problem-solving skills obtained a homogeneity coefficient value (F) of 1.732, with a significance value of 0.166. As the significance is greater than 0.05 (0.166> 0.05), it can be concluded that the post-test variable of the problem-solving skills meets the homogeneous requirements. Overall, the homogeneity test results obtained through the Levene's test of the pre-test, and post-test variables of the problem-solving skills obtained significance values (p) greater than 0.05 (p> 0.05). Thus, the data used has a homogeneous variety between the treatment group.

Research hypothesis testing was conducted to prove statistically whether the hypothesis proposed in this study can be accepted or rejected. Hypothesis testing is undertaken by analysing the results of the application of MURDER collaborative learning. The results of the analysis, which will be used as hypothesis testing material in this study, will be briefly presented in the form of Table 3, as follows:

Table 3: Results of Variant Analysis (ANOVA)

Tests of Between Subjects Effects					
Dependent Variable: problem-solving skills					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	744.777[a]	3	248.259	3.644	0.016
Intercept	371853.333	1	371853.333	5457.500	0.000
Kelompok	282.133	1	282.133	4.141	0.045
Motivasi	333.333	1	333.333	4.892	0.029
Kelompok * Motivasi	388.800	1	388.800	5.706	0.019
Error	6336.667	93	68.136		
Total	491525.000	97			
Corrected Total	7081.443	96			
a. R Squared = 0.105 (Adjusted R Squared = 0.076)					

The first hypothesis test shows that there are differences in the learning outcomes of the problem-solving skills between the groups of students using the MURDER collaborative learning method, and the groups of students using the conventional learning, as can be seen in Table 3. In the table, it is 0.045. As the significance value is less than 0.05, it can be concluded that there are significant differences in the learning outcomes of the problem-solving skills between the groups of students who used the MURDER collaborative learning method, and the groups of students who used the conventional learning method. Thus, it can be decided that the first hypothesis is significantly accepted.

The second hypothesis Test shows that there are differences in the learning outcomes of the problem-solving skills between the groups of students who have low achievement motivation, and the groups of students who have high achievement motivation, as can be seen in Table 3. In the table, it is 0.029. As the significance value is less than 0.05, it can be concluded that there are significant differences in the learning outcomes of the problem-solving skills between the groups of students who have low achievement motivation, and the groups of students who have high achievement motivation. Thus, it can be decided that the second hypothesis is significantly accepted.

The third hypothesis test shows that there is an interaction between the MURDER collaborative learning method, and achievement motivation upon the learning outcomes of the problem-solving skills, as can be seen in Table 3. The table shows 0.019. As the significance value is less than 0.05, it can be concluded that there is a significant interaction between the MURDER collaborative learning method, and achievement motivation upon the learning outcomes of the problem-solving skills.

Discussion
Effect of Learning Strategies on Problem-Solving Skills

Based on the results of hypothesis testing, it was concluded that a significant difference was obtained between the experimental, and control groups regarding their problem-solving skills. In this study, the experimental group was treated with a MURDER collaborative learning strategy, while the control group was treated with a conventional learning strategy. Thus, it can be stated that the MURDER collaborative learning strategies are better than conventional learning strategies for problem-solving.

The MURDER model, according to Ariningsih, Suarni, and Suranata (2013), A. L. Dewi, Wahyuningsih, and Oktaviani (2019), and Nuryanti (2016), is a cognitive psychology perspective that produces a collaborative learning model. The MURDER cooperative learning model is the abbreviation of: mood, understand, recall, detect, elaborate, and review.

The MURDER collaborative learning method emphasises the importance of students' language skills or verbal skills in repeating and reconstructing the information and ideas of learning material to be understood and used as their own, which can then be re-communicated verbally well (Anggraini et al., 2017; Ayunani, 2013; Masela & Marasabessy, 2016). Collaborative students understand that learning is a social activity. They see themselves as others see them, can articulate ideas to others, have empathy, and are open to differences of opinion. They have the ability to identify their own strengths, and the strengths of others (Kamdi, 2011).

Meanwhile, conventional learning strategies lack optimal results. As stated by E. R. Dewi (2018), the conventional learning process is often carried out by teachers at the elementary, junior high, and high school levels. The process of reciprocal communication between teacher and student is less optimal. The teacher does not pay attention to the context and background of each student. Even though each student has their own experience, context, and background, an emphasis upon the cognitive side (competence) is more dominant in the learning process. Students often do not know the benefits of each teaching material in daily life. Students learn only to obtain grades, and not to learn for life. The teacher lacks integrating human values in every teaching material during the learning process.

Previous studies that examined collaborative learning models, were conducted by Kosman (2019), among others, and concluded that there were significant differences in the effectiveness between the effects of learning with collaborative learning models and lecture methods upon the student learning outcomes that were linked to learning motivation. Meanwhile, Darmiati (2020), in his research, showed that there were significant differences in the English learning outcomes between students who were taught using the MURDER collaborative learning method, and those who were taught using conventional learning methods.

Whereas, Nabhan, Pasani, and Sumartono, (2019) in their research, highlighted the following: (1) there are differences in learning motivation, and the problem-solving skills between the students who learn by using the MURDER cooperative learning model, and the students who study with conventional learning models; (2) there are differences in the learning motivation between the students who learn by using the MURDER cooperative learning model, and the students who learn with conventional learning models; and (3) there are differences in the problem-solving skills between the students who learn by using the MURDER cooperative learning model, and the students who learn with conventional learning models.

Izzati (2016) noted the problem-solving skills students learned through the collaborative learning model, which were assisted by authentic problems, were higher than those taught by conventional learning methods. Another study, conducted by Dian Anggreni et al. (2019), showed that there were significant differences in the collaborative learning models assisted by mapping to the learning outcomes of the problem-solving skills before controlling the student achievement motivation, and after controlling the student achievement motivation. Judging from the average score, the experimental group learning outcomes were greater than the average score of the control group. Thus, a collaborative learning model which is assisted with mind maps, and in terms of student achievement motivation, influences the learning outcomes of problem-solving skills.

Effect of Achievement Motivation on Problem-Solving Skills

Referring to the analysis results of the hypothesis testing, which was presented in the previous chapter, it was found that there are significant differences between the high motivation, and low motivation groups on the learning outcomes of problem-solving skills. Thus, the students who have high achievement motivation are better at achieving the learning outcomes of the problem solving skills when compared to the students who have low achievement motivation.

An achievement is very closely related to expectations. Thus, achievement motivation is very different from other motivations, such as hunger, thirst, and other biological feelings (Astuti, 2018; Hasnawati, Sulastri, & Anwar, 2019). The term, 'motive', comes from 'motivation', which means a sense of desire in the human heart to carry out certain activities in order to achieve a goal (Nurhidayah, 2015; Surya & Husna, 2018). The word 'motive' is often interpreted as an internal state or preparedness. Motivation is the energy that changes in the heart, and is in the form of feelings that are responded to by a goal (Brunstein & Heckhausen, 2018).

Achievement motivation is an impetus or motive that exists in every student to direct their behaviour, in order to achieve success in learning and education. Motivation is a reason for a

person to behave in certain situations. It is possible that the achievement motivation in a student is expected to influence the student's problem-solving skills and mathematical problems correctly because achievement motivation can form creative, and responsible individuals. According to Aspriyani (2017), and Ulfah, Santoso, and Utaya (2016), people who have high achievement motivation, have the following characteristics: (1) have personal responsibility, (2) determine the value to be achieved or set superior standards, (3) try to work creatively, (4) try to achieve goals, and (5) have moderate tasks. Thus, it is expected that students who have achievement motivation can improve their learning, so that their problem-solving skills in various mathematical problems are good and appropriate.

The results of this study are also supported by the findings of several studies, including the work of Dian Anggreni et al. (2019). The results of their study indicate that there is a significant and positive influence between the learning media, and achievement motivation upon learning outcomes. According to Trisnowali (2017), the results of the study showed that there was an influence of achievement motivation, interest in learning mathematics, and learning attitudes towards student learning outcomes.

Based on the discussion above, it can be concluded that people or students who have high achievement motivation and low achievement motivation. People or students who have high achievement motivation will perceive that success is the result of hard work and will. Conversely, people or students who have low achievement motivation will perceive that failure is due to feeling lazy.

Effect of Interaction of Learning Strategies and Achievement Motivation upon Problem-Solving Skills

Based on the results of the analysis of the hypothesis test above, it was found that there is a significant difference between the interaction of learning groups, and motivation upon the learning outcomes of the problem-solving skills. Therefore, there is an interaction between the learning that is applied with achievement motivation towards the learning outcomes of problem-solving skills.

The benchmarks that can be used as indicators of the success of a student in the learning activities can be seen from the achievement of the student learning concerned. Student learning outcomes are focussed on the value or numbers achieved by students in the learning process at school. This value is mainly seen from the cognitive side because this aspect is often assessed by teachers to determine the mastery of knowledge, as a measure of student achievement. Motivation is one of the factors that affects student learning outcomes. According to Taliningsih and Tutur (2019), motivation is a condition found in a person that encourages certain activities to achieve a goal. One of the most important motivational theories in

psychology is achievement motivation. Students who have high achievement motivation tend to experience success in completing study assignments at school.

Besides that, in addition to the importance of learning motivation, the application of appropriate learning strategies can increase learning motivation and learning outcomes. Research conducted by Uswati (2014) shows that the average learning outcomes of students taught with collaborative learning strategies are higher than the average learning outcomes taught with competitive learning strategies. Thus, collaborative learning strategies are more effectively applied in learning to improve student learning outcomes. In addition, the average learning outcomes with high learning motivation is higher than the average learning outcomes with low learning motivation. Furthermore, based on the results of statistical testing, there is an interaction between the learning strategies with learning motivation, where students with high learning motivation are more precisely taught using collaborative learning strategies. Meanwhile, the students with low learning motivation are more accurately taught with competitive learning strategies.

Almost the same research was carried out by Utami, Margunayasa, and Kusmariyatni (2019), where the results of the study showed that there were significant differences in a collaborative learning model which was assisted by a map of learning outcomes before controlling student achievement motivation, and after controlling student achievement motivation. The above research findings were also supported by Darmika, Suma, and Suastra's (2014) research, where the results of the study found firstly, that the motivation and learning achievement of students who learn with MURDER cooperative learning models are better than the groups of students learning with conventional learning models. Secondly, the learning achievements of students who learn with the MURDER cooperative learning model is better than the groups of students who study with conventional learning models.

Conclusion

Based on the results of the research and discussion above, the following conclusions can be made. Firstly, there is a significant difference in the learning outcomes of problem-solving skills between the groups of students using the MURDER collaborative learning strategies compared with the groups of students using the conventional learning strategies. This is due to the fact that the application of the MURDER collaborative learning strategy is better at improving the learning outcomes of problem-solving skills, when compared to those applying conventional learning strategies. Secondly, there is a significant difference in the learning outcomes of the problem-solving skills between the groups of students who have high achievement motivation, and the groups of students who have low achievement motivation. This is due to the fact that the groups of students who have high achievement motivation can better improve their problem-solving learning outcomes when compared to the groups of

students who have low achievement motivation. Thirdly, there is an interaction between the MURDER collaborative learning strategies, as well as conventional learning strategies, and the achievement motivation towards problem-solving skills. This means that together, the MURDER collaborative learning strategies, and the achievement motivation affect the learning outcomes of problem-solving skills.

Acknowledgments

REFERENCES

Anggraini, B. L. S., Wendra, W., & Putrayasa, I. B. (2017). Penggunaan Model Pembelajaran Kooperatif Murder Menulis Teks Eksposisi Kelas X IPB Di Madrasah Aliyah Negeri Patas Tahun Ajaran 2016-2017. *Journal Jurusan Pendidikan Bahasa Dan Sastra Indonesia, Undiksha*. 7, 2, 125-136.

Ariningsih, N. M., Suarni, N. K., & Suranata, K. (2013). Pengaruh Model Pembelajaran Kooperatif Tipe MURDER Berbantuan LKS Terhadap Hasil Belajar IPA Siswa Kelas V SD Gugus IV Kecamatan Tabanan. *Mimbar PGSD Undiksha*.1,1, 185-196. https://doi.org/http://dx.doi.org/10.23887/jjpgsd.v1i1.846

Aspriyani, R. (2017). Pengaruh Motivasi Berprestasi Siswa Terhadap Kemampuan Pemecahan Masalah Matematis. *Jurnal Penelitian Dan Pembelajaran Matematika*. 10, 1, 265-290. https://doi.org/10.30870/jppm.v10i1.1194

Astuti, P. (2018). Perbedaan motivasi berprestasi siswa kelas iv, v, dan vi sekolah dasar. Perspektif Ilmu Pendidikan, 32(2), 87-93. https://doi.org/10.21009/pip.322.1

Ayunani, M. (2013). Penerapan Model Pembelajaran Kooperatif Tipe MURDER (Mood, Understand, Recall, Degest, Expand, Review) Untuk Meningkatkan Hasil Belajar Fisika Siswa Kelas VIII SMP Negeri 16 Palu. *JPFT (Jurnal Pendidikan Fisika Tadulako Online)*. 2,1, 134-140. https://doi.org/10.22487/j25805924.2013.v1.i1.2457

Brunstein, J. C., & Heckhausen, H. (2018). Achievement Motivation. In *Motivation and Action, Third Edition*. https://doi.org/10.1007/978-3-319-65094-4_6

Darmiati, D. (2020). Penerapan Model Pembelajaran Collaborative Learning Untuk Meningkatkan Hasil Belajar Bahasa Inggris Materi Descriptive Text. Jurnal Nasional Komputasi dan Teknologi Informasi (JNKTI), 3(1), 18-23. https://doi.org/10.32672/jnkti.v3i1.2011

Darmika, N., Suma, M., & Suastra, M. (2014). Pengaruh Model Pembelajaran Kooperatif Murder Terhadap Motivasi Belajar dan Prestasi Belajar IPA Siswa SMP. *Jurnal Pendidikan Dan Pembelajaran IPA Indonesia*. 4,1 177-187.

Dewi, A. L., Wahyuningsih, E. D., & Oktaviani, D. N. (2019). Deskripsi kemampuan pemahaman konsep matematika peserta didik dengan model pembelajaran murder berbantuan puzzle math. Jurnal Math Educator Nusantara: Wahana Publikasi Karya Tulis Ilmiah Di Bidang Pendidikan Matematika, 5(01), 59-69. https://doi.org/10.29407/jmen.v5i01.12397

Dewi, E. R. (2018). Metode Pembelajaran modern dan konvensional pada sekolah menengah atas. PEMBELAJAR: Jurnal Ilmu Pendidikan, Keguruan, dan Pembelajaran, 2(1), 44-52. https://doi.org/10.26858/pembelajar.v2i1.5442

Anggreni, I. D. A. Y. D., Margunayasa, I. G., & Kusmariyatni, N. N. (2019). Pengaruh model pembelajaran kolaboratif ditinjau dari motivasi berprestasi terhadap hasil belajar ipa. Indonesian Journal of Educational Research and Review, 2(2), 125-136.https://doi.org/10.23887/ijerr.v2i2.17333

Fadhli, M., Brick, B., Setyosari, P., Ulfa, S., & Kuswandi, D. (2020). A Meta-Analysis of Selected Studies on the Effectiveness of Gamification Method for Children. International Journal of Instruction, 13(1), 845-854.. https://doi.org/10.29333/iji.2020.13154a

Gunawan W, Degeng INS, Utaya S, S. (2019). The Improvement of Conceptual and Procedural Understanding by Scaffolding with Responsiveness. *International Journal of Innovation, Creativity and Change*, *7*(5), 162–179. Retrieved from https://ijicc.net/images/vol7iss5/7517_Gunawan_2019_E_R.pdf

Hasnawati, Sulastri, T., & Anwar, M. (2019). Pengaruh Model Pembelajaran dan Motivasi Berprestasi Terhadap Hasil Belajar Peserta Didik Kelas XI IPA SMA Negeri 6 Takalar. *Chemistry Education Review (CER)*. 24,29, 156-163. https://doi.org/10.26858/cer.v2i2.8951

Iptihani, H., & Lutfi, S. (2019). Penerapan Model Pembelajaran Kooperatif Tipe Murder terhadap Keaktifan dan Hasil Belajar Desain Grafis. Edumatic: Jurnal Pendidikan Informatika, 3(2), 61-67. *Informatika*. https://doi.org/10.29408/edumatic.v3i2.1652

Izzati, N. (2017). Meningkatkan Kemampuan Analisis Matematis Mahasiswa pada Mata Kuliah Kajian Pembelajaran Matematika Modern Melalui Pembelajaran Kolaboratif MURDER. Jurnal Pendidikan Matematika, 3(1), 15-28.https://doi.org/10.24235/eduma.v5i1.597

Kamdi, W. (2011). Paradigma baru pendidikan teknologi dan kejuruan: kerangka pikir inovasi pembelajaran. Teknologi dan Kejuruan, 34(1). 114-123. https://doi.org/http://dx.doi.org/10.17977/tk.v34i1.3022

Kosman, K. (2019). Upaya meningkatan kinerja guru dalam pembelajaran melalui supervisi edukatif kolaboratif secara periodik. Jurnal Educatio FKIP UNMA, 5(1), 37-43.https://doi.org/10.31949/educatio.v5i1.34

Mahanani, L. G., & Budi Murtiyasa. (2016). Kemampuan pemecahan masalah matematika aljabar berbasis timss pada siswa SMP Kelas VIII. *Seminar Nasional Pendidikan*

Matematika. 122-132.

Masela, A., & Marasabessy, M. I. (2016). Penerapan Model Pembelajaran Kooperatif Tipe MURDER (Mood, Understand, Recall, Digest, Expand, Review) Terhadap Hasil Belajar dan Aktivitas Siswa Materi Peluang Kelas XI IPS SMA Advent Maluku. *Jurnal Bimafika*. 8,1, 158-169.

Nabhan, A., Pasani, C. F., & Sumartono, S. (2019). Penerapan Model Think Talk Write (TTW) Pada Pembelajaran Matematika Untuk Membangun Keterampilan Kolaboratif Siswa di Kelas VIII SMP Negeri 24 Banjarmasin Tahun Pelajaran 2019. *EDU-MAT: Jurnal Pendidikan Matematika*.7, 2, 188-196. https://doi.org/10.20527/edumat.v7i2.7376

Nikmah, F. (2014). Peningkatan Keaktifan Siswa Dalam Pembelajaran IPA Melalui Model Pembelajaran Kooperatif Tipe TAI (Teams Accelerated Instruction). *Telematics and Informatics*. 15, 22, 111-122. https://doi.org/10.1177/1742766510373715

Nurhidayah, D. A. (2016). Pengaruh motivasi berprestasi dan gaya belajar terhadap prestasi belajar siswa pada mata pelajaran Matematika SMP. Jurnal Dimensi Pendidikan Dan Pembelajaran, 3(2), 13-24.https://doi.org/10.2426/DPP.V3I2.%Y.PP%

Nuryanti, M. (2016). Peningkatan Kemampuan Komunikasi Dan Berpikir Kritis Matematis Melalui Model Kooperatif Stad Dan Murder. Jurnal Pengajaran MIPA, 21(1), 9-13.https://doi.org/http://dx.doi.org/10.18269/jpmipa.v21i1.654 PENINGKATAN

Oktiani, I. (2017). Kreativitas Guru dalam Meningkatkan Motivasi Belajar Peserta Didik. Jurnal Kependidikan, 5(2), 216-232. https://doi.org/10.24090/jk.v5i2.1939

Prastiti, T. D. (2010). Implementasi Realistic Mathematics Education dengan Memperhatikan Gaya Kognitif Siswa dan Pengaruhnya terhadap Kemampuan Komunikasi dan Pemecahan Masalah Matematika SMP. Jurnal Pendidikan dan Pembelajaran (JPP), 16(1), 67-78.

Santoso, H., & Sos, S. (2015). Pengembangan berpikir kritis dan kreatif pustakawan dalam penulisan karya ilmiah. Jurnal Univeritas Negeri Malang. hlm, 22, 1-17.

Sappaile, B. I., & Pristiwaluyo, T. (2019). Pengaruh Motivasi Belajar dan Konsep Diri Terhadap Kemampuan Pemecahan Masalah Matematika. Indonesian Journal of Educational Studies, 22(1). 124-132. https://doi.org/10.26858/ijes.v22i1.9341

Sugiman, S., Retnowati, E., Ayres, P., & Murdanu, M. (2019). Learning goal-free problems: collaboratively or individually? Jurnal Cakrawala Pendidikan, 38(3), 590-600. https://doi.org/10.21831/cp.v38i3.26914

Surya, E., & Husna, A. (2018). Hubungan sense of humor, kecerdasan emosional dan motivasi berprestasi terhadap hasil belajar matematika siswa kelas x smk teladan kota batam. pythagoras: Jurnal Program Studi Pendidikan Matematika, 7(1), 68-77. https://doi.org/10.33373/pythagoras.v7i1.1190

Taliningsih, & Tutur. (2019). Pengaruh Penugasan Jurnal Belajar pada Model Problem Solving terhadap Hasil Belajar Kognitif dan Kemampuan Berpikir Tingkat Tinggi Siswa pada Berbagai Tingkat Motivasi Berprestasi dalam Pembelajaran Larutan Penyangga. *DISERTASI Dan TESIS Program Pascasarjana UM*.4, 26, 111-126.

Uswati, T. S. (2016). Implementasi Model Pendekatan Collaborative Problem Solving (Cps) Dalam Meningkatkan Kualitas Pembelajaran. Edueksos: Jurnal Pendidikan Sosial & Ekonomi, 3(1). 101-103.

Trisnowali, A. (2017). Pengaruh Motivasi Berprestasi, Minat Belajar Matematika, Dan Sikap Belajar Matematika Terhadap Hasil Belajar Matematika Pada Siswa Sman 2 Watampone. MaPan: Jurnal Matematika dan Pembelajaran, 5(2), 259-278. https://doi.org/10.24252/mapan.v5n2a8

Ulfah, K. R., Santoso, A., & Utaya, S. (2016). Hubungan motivasi dengan hasil belajar IPS. Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan, 1(8), 1607-1611.https://doi.org/10.17977/jp.v1i8.6678

Utami, N. M. Y., Margunayasa, I. G., & Kusmariyatni, N. N. (2019). Pengaruh model pembelajaran kolaboratif berbantuan peta pikiran terhadap hasil belajar ipa ditinjau dari motivasi berprestasi. Jurnal Ilmiah Pendidikan Profesi Guru, 2(2), 139-151.https://doi.org/10.23887/jippg.v2i2.19178

Wardani, S. K., Setyosari, P., & Husna, A. (2019). Pengembangan Multimedia tutorial mata pelajaran ipa pokok bahasan sistem tata surya kelas vii mts raudlatul ulum karangploso. Jurnal Kajian Teknologi Pendidikan, 2(1), 23-29.

Warouw, W. S., Hadjar, I., & Hamid, A. (2016). Penerapan Model Pembelajaran Kooperatif Tipe MURDER Panjang Garis Singgung Persekutuan Dua Lingkaran Di Kelas VIII SMP Negeri 6 Palu. *AKSIOMA Jurnal Pendidikan Matematika*.5,2,116-132.