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Profile of Collaborative Problem Solving among XI Grade Students in Solving Financial Mathematics Problems

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Abstract

The aim of this research is to describe CPS profile of XI grade students in solving financial mathematics problem. The subject of this research was three pairs of XI grade students which: a pair student consisting of medium-high ability students, a pair student who are both had high ability and a pair student consisting of low-medium ability students. The result showed that a pair student who are both had high ability were able to answer all the question correctly. A pair student consisting of medium-high ability students almost answered all the questions correctly and a pair student consisting of low and medium ability students were unable to answer all the questions correctly. A pair student who are both had high ability and a pair student consisting of medium-high ability students able to design and do problem solving activities well. They also able to work well together when solving the problems. However, a pair student consisting of low-medium ability students unable to design and do the problem solving activities well. They also unable to work well together when solving the problem and tend to work individually. It can be said that based on collaborative problem solving indicators and problem solving result obtained, collaborative problem solving in a pair student who are both had high ability much better than othes.

Keywords: Collaborative Problem Solving, Financial Mathematics

Abstrak

Tujuan penelitian ini yaitu untuk mendeskripsikan profil collaborative problem solving siswa kelas XI dalam memecahkan masalah matematika finansial. Subjek penelitian ini yaitu tiga pasang siswa kelas XI dengan rincian: satu pasang siswa yang terdiri dari siswa berkemampuan matematika sedang dan tinggi, satu pasang siswa yang keduanya berkemampuan matematika tinggi dan satu pasang siswa yang terdiri dari siswa berkemampuan matematika rendah dan sedang. Hasil penelitian menunjukkan bahwa pasangan siswa yang tingkat kemampuan matematikanya sama-sama tinggi mampu menjawab semua pertanyaan yang diberikan dengan tepat. Pasangan siswa yang terdiri dari siswa berkemampuan matematika sedang dan tinggi hampir menjawab seluruh pertanyaan yang diberikan dengan tepat, sedangkan pasangan siswa yang terdiri dari siswa berkemampuan matematika rendah dan sedang tidak mampu menjawab semua pertanyaan yang diberikan dengan tepat. Pasangan siswa yang tingkat kemampuannya sama-sama tinggi dan pasangan siswa yang tingkat kemampuan matematikanya sedang dan tinggi mampu merancang dan melaksanakan aktivitas pemecahan masalah dengan baik. Mereka juga mampu bekerja sama dengan baik saat memecahkan masalah. Namun, pasangan siswa yang terdiri dari siswa berkemampuan matematika rendah dan sedang tidak mampu merancang dan melaksanakan aktivitas pemecahan masalah dengan baik. Mereka juga tidak mampu bekerja sama dengan baik selama proses pemecahan masalah dan cenderung bekerja secara individu. Dapat dikatakan bahwa berdasarkan indikator collaborative problem solving serta hasil pemecahan masalah yang diperoleh, collaborative problem solving pada pasangan siswa yang berkemampuan sama-sama tinggi lebih baik daripada pasangan yang lain.

Kata kunci: Collaborative Problem Solving, Matematika Finansial

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Introduction

The 21st century is a century that has significant changes compared to the previous century, especially in educational field. Education in the 21st century is expected to produce high-quality individuals so that they can face and answer the challenges that exist in society. Individuals in the 21st century must equip themselves with several skill to support their success in academics and careers in

the future (Hao, Liu, Davier, Kyllonen, and Kitchen, 2016). Some skills that need to be mastered by individuals in the 21st century are collaborative skills and problem solving skills (Latip, Andriani, Purnamasari, dan Abdurrahman, 2020).

Collaborative skills is an individual's ability to work together with others to solve a problem (Fitri, Anggraito, dan Alimah, 2018). Collaborative skills is one of the skills that individuals must master in the 21st century. It is because collaborative skills are one of the essential skills needed at this time (Latip, Andriani, Purnamasari, dan Abdurrahman, 2020). Almost all jobs in the 21st century require individuals to work collaboratively with others. Collaborative skills are used in the workplace and in the community, such as being used in social, religious activities and so on (Apriani, Rohaeni, dan Anah, 2015). Collaborative skills can be trained through learning in schools. By honing collaborative skills, students will indirectly be trained to be responsible, respectful, and critical when working with others.

Collaborative skill different with collaboration skill. Based on KBBI, collaboration means working together to make something, while collaborative means collaboration attitude. PISA 2015 (OECD, 2017) states that collaboration skills are the basis of collaborative skills. If the communication is classified of an individual collaboration skill, then the result of communication provides a window into the cognitive and social process that became the basis of collaborative skill (OECD, 2017).

In addition to collaborative skills, another important skill that individuals must master in the 21st century is problem solving skills (Latip, Andriani, Purnamasari, dan Abdurrahman, 2020). Problem solving is an individual's ability related to cognitive process to understand and solve the problems which the solution is not immediately obvious (OECD, 2014). In other countries, problem solving skills are one of the skills that often used and needed in the workplaace (OECD, 2016). Problem solving ability is one of the goals of learning mathematics, so it is hoped that through learning mathematics, students can master problem solving skills that are the basic skill to face the challenges of society in the 21st century (Widjajanti, 2009).

Research conducted by Koçak, Bozan, and Iúık (2009) found that students who study mathematics in groups can understand the problems better and able to generate innovative ideas to solve the problems. It is also supported by several studies that reveal the fact that working in small groups (collaborating) can improve the quality of problem solving results (Aronson and Patnoe, 1997; Dillenbourg, 1999). In addition, working in groups can reduce the potential for errors when completing the task (Ross, Spencer, Blatz, and Restorick, 2008). From these studies, it can be seen that working in small groups have a positive impact on problem solving outcomes. The individual skills to work together during the problem solving process is known as collaborative problem solving skill. In the 21st century, individuals need to master collaborative problem solving skill because the workface requires a lot of workers who are not only experts in solving problems, but also able to socialize and work together in a team (OECD, 2017).

OECD (2017) defines collaborative problem solving (CPS) as the individuals ability to be involved in problem solving processes with two or more individuals by sharing and collecting knowledge, skills and efforts to find the solutions of the problems. Also, Todd and Forsyth (2020) define CPS as a complex ability construct related to the cognitive and social dimensions of the individual. But in the other hand, CPS defined as the activity of two or more people to solve a problem that becomes a common goal (Malach, Meade, and Morrow, 2012). CPS has different definitions depend on the used context. In this study, collaborative problem solving defined as individual's ability related to the cognitive dimension (problem solving) and social dimension (collaboration) to solve a problem collaboratively.

Every individual have a different problem in his life certainly. To solve the existing problems, individual need to equip themselves with problem solving skills. One of the sciences which are used to train problem solving skills is mathematics (Masrurotullaily, Hobri, dan Suharto, 2013). The application

of mathematics is often found in everyday life, one of them is found in financial sector. The field of Mathematics that studies the application of financial problems and their risks is known as financial mathematics (Yang, 2017). Financial mathematics is one of critical applied sciences in the 21st century, because the fast development of economic conditions make economic problems (especially in the financial sector) develop more complex, so creative solutions and innovation in financial products are needed (Yang, 2017).

Nowadays, many students have difficulty in solving financial math problems, such as calculating profits, taxes, discounts, and so on (Yuliastuti, 2014). By training their collaborative problem solving skills, students are expected to work together to overcome the obstacles when solving financial mathematics problems. Currently, several studies examine collaborative problem solving skills, but the research related to collaborative problem solving skills in solving financial mathematics problems is still unavailable. Therefore, in this study, researchers are interested in examining the Profile of Collaborative Problem Solving among XI grade Students in Solving Financial Mathematics Problems.

Method

This research is descriptive qualitative research that aims to describe collaborative problem solving profiles of XI grade students in solving financial mathematic problems. Subject of this research were six students who selected from eight students who had done the mathematic ability test. The six selected students were grouped into three groups, each group consisting of two people with details: one group consisting of students with medium and high abilities, one group consisting of students with high mathematics abilities, and one group consisting of students with low and medium mathematics abilities. The selection of this subject used the purposive sampling technique.

The research procedure starts from the preparation stage, which includes preparing the research framework and the research instrument, including the mathematics ability test, the financial mathematics problem solving test, and interview guidelines. After that, the researcher validated the research instrument used by the validator lecturer and continued looking for research subjects. The second stage is the implementation stage which includes: testing the mathematics ability test (TKM), analyzing the results of the TKM, testing the financial mathematics problem solving ability test (TKPMMF), conducting interviews, and analyzing the TKPMMF and interview results data. The last stage is the stage of preparing research reports.

There are two instruments used in this study: the main instrument and the supporting instrument. The main instrument in this study is the researcher, while the supporting instruments consist of: a mathematics ability test (TKM), a financial mathematics problem solving ability test (TKPMMF), and interview guidelines. The mathematics ability test was used to obtain data on the subject's mathematics ability. TKM consists of five questions that the subject must do individually within 60 minutes. The results of the subject's mathematics ability test are grouped according to the following table:

Table 1. Mathematics Ability Category (Ditjen Dikdasmen, 2017)

Score	Mathematics Ability Category
$80 \leq x \leq 100$	High
$65 \leq x < 80$	Medium
$0 \leq x < 65$	Low

In this study, the researcher adoption the ability indicator collaborative problem solving compiled by OECD (2017). These indicators are used to analyze the results of subject interviews related to the collaborative problem solving process. The following are indicators of collaborative problem solving abilities used in this study:

Table 2. Indicators of collaborative problem solving (OECD, 2017)

CPS Basic Abilities	Indicators
Establishing and maintaining shared understanding	• Subjects can identify information and knowledge to solve problems together. • Subjects can formulate problem solving plan together. • Subjects can re-examine the problem solving plan that will be used.
Carry out the problem solving activities	• Subjects are able to determine appropriate collaborative actions when solving problems. • Subjects are able to share problem solving tasks with their partners. • Subject is able to realize the problem solving plan with his partner. • Subjects are able to give each other an evaluation of the results of their partner's thoughts.
Establishing and maintaining team organisation	• Subject understands the rules that apply in the group. • Subjects obey the rules in the group. • Subjects understand their roles and tasks when solving problems. • Subjects give each other feedback regarding the efforts their partner has made to solve the problem.

Result and Discussion

The data collection process was on 22 – 29 March 2021. The mathematics ability test was conducted online, while the financial mathematics problem solving ability test and interviews were conducted offline (face to face). Based on the analysis of the results of the TKM and referring to the characterized level of mathematics ability by ditjen dikdasmen (2017), subject of this research obtained are as follow:

Table 3. The Subject

Subject		Sex	Level of Mathematics Ability
S1	DF	Female	Medium
	NM	Female	High
S2	HM	Male	High
	AFI	Male	High
S3	FN	Female	Low
	AS	Female	Medium

The description of the research results obtained by the researcher is as follows:

CPS Profile of S1 in solving financial mathematics problem

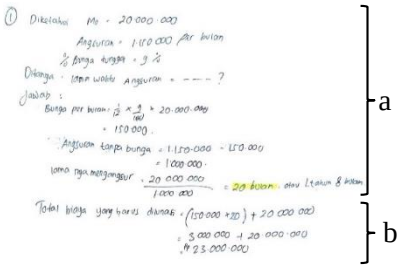

Figure 1. S1's answer of number (1)

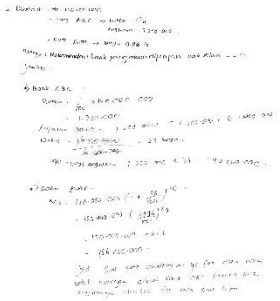

Figure 2. S1's answer of number (2)

Based on the results of the answers above, it can be seen that S1 can relate concepts (knowledge) that they get to solve the problem given. In addition, S1 can also write down problem solving steps systematically. There are two critical parts of number 1 answer's given by S1. Section (a) contains the steps that S1 used to determine the loan repayment period. While part (b) contains the steps used by S1 to ensure the answer obtained in part (a) is the correct answer. For answer number (2), S1 is less careful in converting the interest percentage at Super Banks in ordinary fractions. It causes the results of the calculation of Mt in Super Banks to be inaccurate.

S1 was able to identify all the information presented in question number (1), but S1 did not identify all the information presented in question number (2). Based on the result of interviews, it is also known that S1 had difficulty in writing down problem solving ideas for question number (1). S1 spends some time discussing and relating his knowledge to the problems presented in question number (1). However, when working on question number (2), S1 did not find it challenging to find problem solving ideas because S1 adopted the method used in question number (1) to find the installment period at ABC Bank. This step is a crucial step to determine the next problem solving step in question number (2). S1 did not re-check the problem solving design for questions number (1) and (2) so that the improvement of the problem solving design was carried out when implementing the two problem solving designs.

The type of collaboration which is conducted by S1 is collaborative work, so that when they encounter obstacles when solving the given problem, they decide to find a solution first rather than go through it to solve the following problem. S1 can also realize most of the problem solving plans they compiled with some improvements in several parts. There is an indirect division of tasks and roles during the problem solving process, specifically as an idea seeker and an evaluator of each partner's work. S1 pairs (DF and NM) can identify their respective strengths and weaknesses so that during the problem solving process, both DF and NM can cover up their weaknesses by taking advantage of their partner's strengths. NM is more an idea seeker during the problem solving process than an evaluator, while DF is more an evaluator than an idea seeker. This is in accordance with the research conducted by Safitri (2018) which describe that students with high mathematics abilities are faster in finding ideas and connecting the information obtained with their knowledge to solve problems than students with moderate or low mathematics abilities.

S1 does not enforce specific rules when solving the problem. However, it does not create new problems that can interfere with their collaboration process. DF and NM can understand each other and obey the basic rules when working well together, so that neither one of them feels "most contributed" when solving problems. DF and NM can provide feedback when they express opinions, suggestions, or ideas to solve the given problem.

CPS Profile of S2 in solving financial mathematics problem

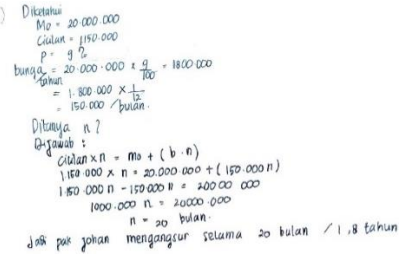

Figure 3. S2's answer of number (1)

Figure 4. S2's answer of number (2)

Based on the answers above, it can be seen that S2 can identify knowledge (concepts) that can be used to solve the problem correctly. S2 was able to find the right solution for problem number (1); however, S2 made a few mistakes when converting 20 months into years. S2 adopts the method he used in question number (1) to determine the installment period at ABC Bank in question number (2). S2 had a misunderstanding when writing what was asked in question number (2). S2 wrote that the recommendation of the bank that the borrower should choose is the bank that provides the lightest installments, but the conclusions made and the calculations carried out show that the recommendation of the bank that the borrower should choose according to them is the bank that provides the smallest total loan value to the borrower.

S2 was able to identify all the information presented in questions number (1) and number (2), but S2 had made an error in processing the information obtained in questions number (1) and number (2). Based on the interview result, it is also known that the process of formulating the problem solving steps carried out by S2 for question number (1) is different from formulating problem solving steps for question number (2). When formulating the problem solving steps for question number (1), S2 did it together. They also formulate alternative solutions to other problems together when they realize there is an information processing error. However, when formulating problem solving steps for question number (2), they tend to do it separately (HM and AFI formulate their own problem solving steps). S2 can identify the formulation of the most efficient problem solving steps and minimal risk of error for question number (2). S2 did not re-check the problem solving steps they would use to solve the problems in questions (1) and (2), so that the problem solving design improvements were made when they realized the problem solving design. They had no difficulty in writing down the problem solving ideas that they found.

The type of collaboration used by S2 when working on question number (1) is collaborative work, while collaboration type that used by S2 when working on question number (2) is contentious debates in decision making. This strategy change is done because when they continue to apply collaborative work to solve problem number (2), they will have difficulty getting the problem solving design they expect. There is a division of tasks and roles during the problem solving process, namely as an idea seeker and an evaluator of each partner's work during the problem solving process. HM and AFI can

identify their respective strengths and weaknesses to take advantage of each other's strengths to achieve common goals. S2 was able to realize most of the problem solving plans they compiled, although some improvements and changes related to the problem solving design. They are also able to find alternative solutions when needed. During the problem solving process, HM and AFI evaluate each other by giving opinions, suggestions and negotiating related decisions during the problem solving process.

S2 does not enforce specific rules during the problem solving process, but this does not create new problems when they work together. Both HM and AFI can understand the situation and conditions that occur to control their behavior and attitudes. HM and AFI are both capable of being both an idea seeker and an evaluator during the problem solving process so that no one dominates as an "idea seeker" or an "evaluator." They can also understand their duties and roles well so that none of them feels "the most work" during the problem solving process. HM and AFI can provide feedback when they express opinions, suggestions, or ideas to solve the problems given.

CPS Profile of S3 in solving financial mathematics problem

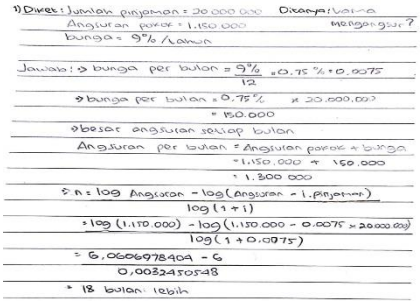

Figure 3. S3's answer of number (1)

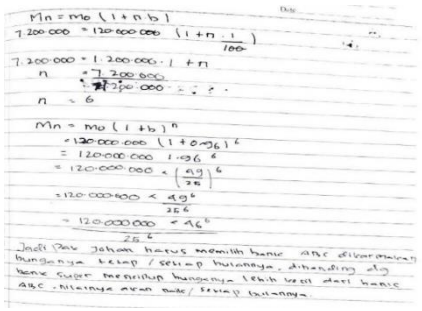

Figure 3. S3's answer of number (1)

Based on the results of the answers above, it can be seen that S3 (FN and AS) did not succeed in finding the correct answer for each question. For number (1), S3 does not understand the meaning of "installments per month" contained in the question. There is some additional information that S3 does not use in the calculation process, one of which is the amount of interest per month. For number (2), S3 did not write down any information they got when reading the question, but they directly entered the calculation process. S3 considers that the number of installments is the final capital in single interest (Mn). When calculating "n" in Bank ABC, S3 made an error by dividing 120,000,000 with 100. This calculation result performed after that will give an incorrect result. S3 use logic in concluding the results obtains. They argue that the bill that must return at the Super Bank is greater than the bill that must return at the Bank ABC, because the longer the repayment period at the Bank Super, the bills that must be returned to the Bank Super was greater.

S3 can identify all the information presented in question number (1), but they experience a fatal error when identifying the information presented in question number (2). Based on the result interviews, it is also known that S3 considers the installment is Mn (the bills that must be returned to the Bank). This misunderstanding of an information can cause "unexpected result" when individual or team doing the calculation. S3 also cannot grasp the essence and explain in their language what is being asked from

question number (2). It is based on the fact that when working on question number (2), FN asking to the researcher about the core questions of question number (2). When compiling a problem solving plan for question number (1), FN and AS admitted that they browsed the installment formula on the internet because they forgot the installment formula, but the formula they got was incorrect. It indicates that FN and AS do not understand the concept of loan installments and cannot relate the information they have obtained with their knowledge. When compiling a problem solving plan for problem number (2), the idea obtained is correct, but this idea will also not give the right result if they enter the information obtained into the formula incorrectly. S3 does not re-examine problem solving plan that they will use.

The type of collaboration used by S3 when solving the problem is share the task. Each of them have to solve 1 of the two questions given. This assignment is done randomly. The applied collaboration model causes collaboration activities by S3 run passively compared to collaborative activities carried out by S1 and S2. The interaction and communication by S3 during collaboration process was rarely. S3 was able to realize the problem solving plans that they compiled, although there were still corrections to the calculation errors in some parts, and the results obtained were also inaccurate. The evaluation process implemented by exchanging answer sheets to ensure that the partner has done the task with responsibly.

S3 does not apply special rules during the problem solving process, and they are allowed to do something that is not related to the problem solving process as long as they can be responsible for their tasks. S3 is more likely to work individually than working together as a team, although there are still discussions and correcting each other during the problem solving process. The tasks and roles that are assigned to them are more accomplished individually than working together. Based on the researcher's observations, FN was less enthusiastic when solving problems together, so the AS's enthusiasm was also affected more or less. It is supported by Andrews and Rapp's (2015) research, which states that collaboration can lead to reduced motivation and loss of productivity if one member of the group contributes less. Both FN and AS can provide feedback when they express opinions, suggestions, or ideas to solve the given problem.

Based on the results of the work and subject interviews, it can be seen that pairs of subjects with high mathematics abilities can solve all the questions given correctly. They can also explain the problems presented in their language, even though there are inconsistencies between the questions they write and the calculations and conclusions they get. In addition, they can identify the most effective forms of cooperation to implement. The form of cooperation they apply is adjusted based on the ability and level of complexity of the questions presented. The pair of subjects with medium and high abilities can solve all the questions correctly, but there is an information processing error at the end, which causes the calculation results obtained be inaccurate. During the problem solving process, the pair of subjects with medium and high abilities were able to work well together.

In this study, the only subjects who could not solve all the questions correctly were the pair students that consisting of low and medium abilities. The pair students that consisting of low and medium abilities were also the only subjects who used the internet to find answers to the questions given. It shows that the pair students that consisting of low and medium abilities do not understand and cannot solved mathematics problems in the financial sector. It is supported by research conducted by Rianti (2018), which states that students with medium and low mathematics abilities cannot solve the problem correctly. Interaction and communication that exist during the problem solving process also run passively. In addition, it can also be seen that the pair student who are both had high ability and the pair student consisting of medium-high ability students can actively communicate with their partners rather than communication that occurs in the pair students that consisting of low and medium abilities. In fact, according to Hao and Mislevy (2019), communication plays a vital role in the process of collaborative problem solving. Based on this description, it can be seen that pairs of subjects who have at least one member with high mathematics skills or good social skills can solve financial mathematics

problems well. On the other hand, pairs of subjects who do not have at least one high ability or good social skills cannot solve all the questions given well. It is supported by research conducted by Todd and Forsyth (2020), which states that teams that have at least one member with high social or cognitive abilities can encourage problem solving performance by the group.

Conclusion

Based on data analysis using indicators that have been compiled, it can be said that collaborative problem solving profile of XI grade students in solving financial mathematics problems is as follows: a pair student who are both had high ability are able to answer all the questions given correctly and a pair student consisting of medium-high ability students answer almost all of the questions are given correctly. However, a pair student consisting of low-medium ability students could not answer all the questions correctly. A pair student who are both had high ability and a pair student consisting of medium-high ability students are able to establishing and maintaining shared understanding when designing problem solving steps by exchanging ideas or combining their own efforts. While, a pair student consisting of low-medium ability students are unable to establishing and maintaining shared understanding when designing problem solving steps. The sudent's pair who are both had high ability and the student's pair consisting of medium-high ability students were able to realize several problem solving plans that had been prepared and improve them and even look for other solutions if needed. However, problem solving activities by the student's pair consisting of low-medium ability students did not go well. This is evidenced by the browsing actions when solving problems. The sudent's pair who are both had high ability and the student's pair consisting of medium-high ability students were able to establish and maintain team organisation by understanding and taking responsibility for the tasks and roles assigned to them, while the student's pair consisting of low-medium ability students unable to build and maintain good cooperation. This is evidenced when they are solving the problem, they tend to do it individually and rarely interact with each other.

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References

Andrews, J. J., & Rapp, D. N. (2015). Benefits, Costs, and Challenges of Collaboration. *Translational Issues in Psychological Science*, 182-191.

Apriani, F., Rohaeni, N., & Anah. (2015). Kemampuan Kolaboratif Mahasiswa pada Perkuliahan Bimbingan Perawatan Anak melalui Kegiatan Lesson Study. *Jurnal Kesejahteraan Keluarga dan Pendidikan*, 7-15.

Aronson, E., & Patnoe, S. (1997). *The Jigsaw Classroom: Building Cooperation in The Classroom* (2nd ed.). New York: Longman.

Dillenbourg, P. (1999). *Collaborative Learning: Cognitive and Computational Approaches.* New York: Emerald Publishing.

Ditjen, Dikdasmen. (2017). *Panduan Penilaian oleh Pendidik dan Satuan Pendidikan Sekolah Menengah Atas.* Jakarta: Kemendikbud.

Fitri, F. A., Anggraito, Y. U., & Alimah, S. (2018). The Effectiveness of Guided Inquiry Strategy on Students' Collaborative Skill. *Journal of Biology Education*, 7(2), 144-150.

Hao, J., & Mislevy, R. J. (2019). Characterizing Interactive Communications in Computer-Supported Collaborative Problem-Solving Tasks: A Conditional Transition Profile Approach. *frontiers in psychology,* 1-9.

Hao, J., Liu, L., Davier, A. A., Kyllonen, P., & Kitchen, C. (2016). Collaborative Problem Solving Skills versus Collaboration Outcomes: Findings from Statistical Analysis and Data Mining. *International Conference on Educational Data Mining,* (pp. 382-387). Raleigh.

KBBI. (n.d.). *Arti kata kolaboratif - Kamus Besar Bahasa Indonesia (Online)*. Retrieved April 26, 2021, from https://kbbi.kemdikbud.go.id/entri/kolaboratif

Koçak, Z. F., Bozan, R., & Iúık, Ö. (2009). The Importance of Group Work in Mathematics. *Procedia Social and Behavioral Sciences,* 2363-2365.

Latip, A., Andriani, Y., Purnamasari, S., & Abdurrahman, D. (2020). Integration of Educational Robotic in STEM Learning to Promote Students' Collaborative Skill. *5th Seminar Nasional Matematika dan Pendidikan Matematika (SENATIK)* (pp. 1-6). Semarang: IOP Publishing.

Malach, T. J., Meade, M. L., & Morrow, D. G. (2012). The Effect of Expertise on Collaborative Problem Solving. *Thinking & Reasoning,* 32-58.

Masrurotullaily, Hobri, & Suharto. (2013). Analisis Kemampuan Pemecahan Masalah Matematika Keuangan Berdasarkan Model Polya Siswa SMK Negeri 6 Jember. *KadikmA: Jurnal Matematika dan Pendidikan Matematika*, 129-138.

OECD. (2014). *PISA 2012 Results: Creative Problem Solving: Students' Skill in Tackling Real Life Problems (Volume V).* Paris: OECD Publishing.

OECD. (2016). *Skills Matter: Further Result from the Survey of Adult Skills.* Paris: OECD Publishing.

OECD. (2017). *PISA 2015 Result (Volume V): Collaborative Problem Solving*. Paris: OECD Publishing.

Rianti, R. (2018). Profil Kemampuan Pemecahan Masalah Matematis Siswa SMP Pada Materi Bangun Ruang Sisi Datar. *Jurnal Pendidikan Tambusai*, 802-812.

Ross, M., Spencer, S. J., Blatz, C. W., & Restorick, E. (2008). Collaboration Reduces the Frequency of False Memories in Older and. *Psychology and Aging,* 85-92.

Safitri, H. A. (2018). Profil Berpikir Siswa dalam Memecahkan Masalah HOT ditinjau dari Kemampuan Matematika. *MATHEdunesa: Jurnal Ilmiah Pendidikan Matematika,* 1, 32-39.

Todd, J. A., & Forsyth, C. M. (2020). Exploring Social and Cognitive Dimension of Collaborative Problem Solving in An Open Online Simulation-Based Task. *Computers in Human Behavior*, 1-12.

Widjajanti, D. B. (2009). Kemampuan Pemecahan Masalah Matematis Mahasiswa Calon Guru Matematika: Apa dan Bagaimana Mengembangkannya. *Seminar Nasional Matematika Dan Pendidikan Matematika,* (pp. 402-413). Yogyakarta.

Yang, X. (2017). On the Emergence, Development and Prospect of Financial Mathematics. *Modern Economy,* 1129-1134.

Yuliastuti, M. (2014). Pengembangan Bahan Ajar Aritmatika Sosial pada Siswa SMP Kelas VII dengan Pendekatan Saintifik. *Prosiding Mathematics and Sciences Forum,* 617-624.