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PROFESSIONAL INFLUENCE OF TEACHERS IN THE UNDERSTANDING OF MATHEMATICAL STRUCTURES ON LEARNING OUTCOMES IN TERMS OF SOCIAL EMOTIONAL COMPETENCE

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Abstract

The purpose of this study was to examine the professional influence of teachers in understanding the structure of mathematics on learning outcomes in terms of social emotional competence. This type of research is quantitative with an experimental approach. The population is teachers and students of Class V in Wonogiri district. Sampling technique with cluster random sampling technique. Data collection techniques through: social emotional questionnaire and mathematical structure, as well as tests. Data analysis using Anava two way with same cell and Anava further test. The results of this study showed that F account (90.416) is greater than F table (3.84), meaning that the teacher's professional influence on the learning outcomes of mathematics and F account (28.605) is greater than F table (3.00), social emotional competence influence on learning outcomes mathematics. The conclusion of the study is that professional teachers in understanding the structure of mathematics and social emotional competence of learners affect learning outcomes, namely increased understanding of mathematical concepts. The implication of this study is that the professional competence of teachers in understanding the structure of mathematics and social emotional competence of learners to be one of the determining variables in setting an effective mathematical learning model for the achievement of learning outcomes.

Keywords: learning outcomes, mathematical structure, social-emotional, teacher professional

Abstrak

Tujuan penelitian ini adalah untuk menguji pengaruh profesional guru dalam memahami struktur matematika terhadap hasil pembelajaran yang ditinjau dari kompetensi sosial emosional. Jenis penelitian adalah kuantitatif dengan pendekatan eksperimen. Populasi Adalah guru dan peserta didik kelas V di kecamatan Wonogiri. Teknik pengambilan sampel dengan teknik cluster random sampling. Teknik pengumpulan data melalui: angket sosial emosional dan struktur matematika, serta tes. Analisis data menggunakan Anava dua jalan dengan sel sama dan uji lanjut Anava. Hasil penelitian ini menunjukkan F account (90,416) lebih besar F table (3,84), berarti profesional guru berpengaruh terhadap hasil belajar matematika dan F account (28,605) lebih besar dari F table (3,00), kompetensi sosial emosional berpengaruh terhadap hasil belajar matematika. Kesimpulan penelitian yaitu profesional guru dalam memahamai struktur matematika dan kompetensi sosial emosional peserta didik berpengaruh pada hasil belajar yaitu peningkatan pemahaman konsep matematika. Implikasi penelitian ini adalah kompetensi

profesional guru dalam memahami struktur matematika dan kompetensi sosial emosional peserta didik menjadi salah satu variabel penentu dalam menetapkan model pembelajaran matematika yang efektif untuk pencapaian hasil belajar.
Kata kunci: Hasil belajar, profesional guru, struktur matematika, sosial-emosional

INTRODUCTION

Learning outcomes are the focus of every learning activity, as they are the benchmark for achieving objectives. E. Gee and D. Harefa. (2021) explaining that learning outcomes are changes in students after going through the teaching and learning process, which includes changes in knowledge, understanding, attitudes, skills, and behavior. Southworth, J., Migliaccio, K., Glover, J., Glover, J., Reed, D., McCarty, C., Brendemuhl, J., & Thomas, A. (2023) explaining that learning outcomes are the outputs or outputs of the teaching-learning process, which include: changes in cognitive, changes in knowledge and understanding of concepts; affective, changes in attitudes, values, and rewards; and psychomotor, changes in skills and physical abilities. The above description can be summarized as follows: learning outcomes are the results of learning that develops knowledge, attitudes, and skills.

The learning outcomes in this study focused on describing the development of knowledge, namely conceptual understanding. Ramadhan, D. P., Kuswandi, D., & Soepriyanto, Y. (2023) explaining that understanding the concept is the ability to understand and explain the meaning of an idea, material, or notion in one's own words, as well as being able to use it functionally. Han, F. (2021) explaining that understanding concepts is an activity that is not only memorization, but also the ability to associate one concept with another, provide examples and non-examples, classify objects according to their characteristics, and represent concepts to support problem solving. This explanation can be summarized as follows: conceptual understanding is the ability to explain ideas that are not only educational in nature, but also capable of linking concepts so that they can be applied to solve problems in everyday life.

Conceptual understanding needs to take into account certain indicators. The indicators that students have understood a concept are explained by Yu. L., & Zin, Z. M. (2023) the main characteristics of understanding concepts: re-explain with one's own language; relate concepts; provide examples and non-examples; classify objects; use different representations; apply algorithmically. Otoluwa, S. M., Uloli, R., Abdjul, T., Mursalin, Odja, A. H., & Ntobuo, N. E. (2024) explaining that indicators that learners have an understanding of the concept include: restating the concept in their own words, providing examples and non-examples,classifying objects based on the nature of the concept, presenting the concept in various representations, using the concept to solve problems, associating various concepts, and developing the necessary or sufficient conditions of the concept. The above explanation can be summarized as follows: an indicator that a student has understood a concept is the ability to explain the concept

according to their understanding, provide examples and non-examples, classify objects that are characteristic of the concept, present the concept in various appropriate cases, apply it to solve problems, relate various concepts according to the case, and develop necessary or sufficient conditions for the concept.

Mathematics is knowledge that is abstract and structured. Yunita, D. R., Empress, A., & Solomon, H. (2019) explains that mathematics is a science that studies abstract concepts such as quantity, structure, space, and change through logical reasoning and deductive proof. Resmi, R. A. (2020) explains that mathematics is the study of patterns and relationships, which is often considered a universal language because it uses clear and accurate symbols and serves to solve problems. The above explanation can be synthesized that mathematics is the knowledge of patterns and relationships that are interrelated to solve problems in everyday life.

Mathematics education in elementary school is different from education at later levels. The learning of mathematics in elementary school has characteristics. GarcíA-GarcíA, J., & Dolores-Flores, C. (2019) explained that the characteristics of elementary school mathematics learning are the special characteristics of mathematics learning which include abstract and concrete, have levels, are consistent in rules, have a deductive and inductive approach, and utilize symbols and agreements. Firmasari, S., Solomon, H., Hartono, W., & Noto, M. S. (2019) explained that the characteristics of elementary school mathematics learning are that learning starts from the concrete to the abstract, has a level of cognitive stages, is consistent in abstract rules, the approach used is deductive and inductive. Education above can be defined as learning mathematics in elementary school, including: learning starts from the concept of going to the abstract, has a level of cognitive stages, concepts in learning that are abstract, learning is done is deductive and inductive.

The results of data collection from the field show that teachers in the Wonogiri sub-district still use a textual approach in mathematics teaching. This can be interpreted to mean that 163 of the 172 teachers still rely on teacher's manuals in their teaching, the material presented is Xi oriented towards calculation techniques, mathematical concepts are not linked to previous concepts (partial in nature), and teaching is results-oriented. Teaching oriented towards textbooks involves the following stages: providing explanations of mathematical techniques, guided practice using questions from student workbooks, independent practice using student worksheets, and testing. This has consequences for learning outcomes, particularly in the development of mathematical concept understanding. The test results as a form of learning outcomes from 3 elementary schools with 53 students in grade V showed that the average score was 52.45, the minimum score was 35, the maximum score was 75.50, and the standard deviation was 9.43.

Less optimal learning outcomes in the knowledge domain, namely understanding mathematical concepts, need to be analyzed in terms of teachers competence in understanding mathematics and its structure. Hindardjo, A., Pratama, M. F., & Ali, J. (2022) explaining that teacher competence is a set of knowledge, skills and behaviors that teachers must have in order to carry out their professional duties as educators and teachers

effectively. Brata, D. P. N., & Mahatmaharti, A. K. (2020) explaining that the understanding of teacher competence is the ability of a teacher to carry out his duties and duties properly and responsibly. The above explanation can be summarized as follows: teacher competency is the ability that teachers must possess in order to carry out their duties as educators and instructors professionally.

The teacher competency that is the focus of this study is the ability of teachers to manage mathematics material. Khairiah, A. A., Amin, A., Muassomah, M., Mareta, M., Sulistyorini, S., & Yusuf, M. (2024) explained that the teacher's competence includes four aspects, namely: pedagogic, management of learning and learners; personality, mature and authoritative character; social, ability to interact with various parties; and professional, mastery of subject matter in depth. Nobari, M. Kargarfard, V. Minasian, J. M. Cholewa, and J. Pérez-Gómez. (2021) explaining that the competence of teachers in the professional aspect, including: mastery of learning materials broadly and deeply; the ability to develop and organize learning programs; and mastering various tools, media, and relevant learning resources. The above explanation can be summarized as follows: teacher competence in professional aspects is indicated by measurable abilities in planning, implementing, and evaluating learning, thereby improving conceptual understanding and enabling students to achieve.

In addition to professional competence in building learning outcomes, mathematics learning must also take into account students' social and emotional abilities. Nurhayati et al. (2023) define a child's ability to understand, manage, and express various emotions, and improve relationships with others in their environment. Nugraha and Rachmawati (2021) define social-emotional skills as the ability to understand and manage emotions, build social relationships, adapt to the environment, and achieve a balance between emotional, social, and physical aspects of life. Based on the above opinions, it can be synthesized that social-emotional learning is the ability to manage one's emotions so that one has self-awareness, responsibility for oneself and others, and a pro-social attitude, thereby creating good relationships between students and their environment.

Research relevant to this study is that of Marwan Marwan & Deviyantoro Deviyantoro (2025). Their findings indicate that teacher competence can develop teaching skills, select and determine appropriate learning models, and influence leadership styles. The similarity between the studies lies in the independent variable, namely teacher competency, while the difference lies in the dependent variable, namely from leadership style to learning outcomes.

Based on the above description, the researcher determined the title of the study to be: Professional Influence Of Teachers In The Understanding Of Mathematical Structures On Learning Outcomes In Terms Of Social Emotional Competence. The purpose of this study was to examine the effect of teachers' competency levels in understanding elementary school mathematical structures on student learning outcomes as seen from social-emotional competency in Wonogiri subdistrict.

Although previous studies have established that teacher professional competence contributes to instructional quality and student achievement, and separate studies have shown that students' social-emotional competence influences academic engagement and learning outcomes, empirical studies integrating these two variables within a single analytical framework remain limited. In particular, few studies have examined whether teachers' professional competence in understanding mathematical structures interacts with students' social-emotional competence in shaping conceptual understanding in elementary mathematics learning. This gap indicates the need for research that not only examines the main effects of both variables but also investigates their possible interaction effects.

From a methodological perspective, prior studies have predominantly examined teacher competence and student social-emotional competence independently, with limited use of factorial analysis to compare their combined effects on conceptual understanding. Therefore, this study contributes to extending the literature by positioning teacher professional competence and students' social-emotional competence within a factorial framework to analyze their respective and interactive influences on mathematical conceptual understanding.

RESEARCH METHOD

The type of research is quantitative with an experimental approach more specifically, the present study employed an ex post facto factorial design (2 × 3), involving two levels of teacher professional competence (high and low) and three levels of students' social-emotional competence (high, medium, and low). This design was used to examine both the main effects and interaction effects of the two variables on students' co nceptual understanding in mathematics. Although the study initially adopted an experimental orientation through pre-test and post-test procedures, analytically the design corresponds more closely to a factorial ex post facto approach.

. The population consists of elementary school teachers in Wonogiri subdistrict. The sampling technique used is cluster random sampling, with a sample size of 10 teachers and 207 fifth-grade students. Data collection techniques include social-emotional questionnaires, mathematical structure comprehension competency tests, and mathematics tests. To ensure measurement quality, the research instruments underwent content validation through expert judgment and reliability testing prior to implementation. The social-emotional competence questionnaire and conceptual understanding test were examined for internal consistency using reliability coefficients, while item suitability was reviewed to ensure alignment with the intended constructs. These procedures were conducted to support the validity of the instruments used in measuring the variables under investigation. Research analysis uses a two-way Anova with equal cells, formulated as follows:

$$X_{ijk} = \mu + \alpha_i + \beta_i + (\alpha\beta)_{ij} + \varepsilon_{ijk}$$

(Budiyono, 2016: 207)

Note:

μ : overall mean of data

αi : effect of row i on the dependent variable

βj : effect of column j on the dependent variable

αβ : combination of the effect of row I and column j on the dependent variable

εijk : deviation of data Xijk from its population mean (μij) which is normally distributed with a mean of 0.

Follow-up Anava test with Scheffe's test for comparison between columns, which is formulated as follows:

$$F_{i-j} = \frac{\left(\bar{X}_i - \bar{X}_j\right)^2}{RKG\left(\frac{1}{n_i} + \frac{1}{n_j}\right)}$$

(Budiyono, 2016: 216)

Note:

F_{i-j} = observed F value in the comparison of column i and column j

$\bar{X}_i$ = mean in column i

$\bar{X}_j$ = mean in column j

RKG = mean square error

n_i = sample size of column i

n_j = sample size of column

RESULTS AND DISCUSSION

The selection of teachers as samples was based on the results of teacher competency tests. Five teachers were included in the upper competency group with an average test score of more than 75, and five teachers were included in the lower competency group with an average test score of less than or equal to 75. Teachers in the upper criteria group taught 104 students, while teachers in the lower competency criteria group taught 103 students.

Students were given pre-tests and post-tests before and after the treatment to test prerequisites. The data in this study underwent prerequisite tests, namely normality tests, homogeneity tests, and balance tests. The results were as follows: the pre-test and post-test results of students taught by teachers from the upper and lower competency groups, in order, were: sig. 0.075; 0.064, 0.072, and 0.068, which are greater than 0.05. These results can be interpreted as indicating that the sample comes from a population with a normal distribution. The pre-test results obtained a calculated sig. (0.756) > 0.05, and the Post-Test results obtained a calculated sig. (0.336) > 0.05, so it can be concluded that the test results before and after the treatment are data from the same variant (homogeneous distribution); Calculated t (0.134) < Table t (1.972), meaning that the pre-test of students taught by teachers from the Upper and Lower competency groups had the same average (both groups were balanced).

Students were grouped based on a social-emotional competency questionnaire, with aspects of self-awareness, responsibility for oneself and others, and pro-social attitudes.

Social-emotional competency scores were used to group samples based on the criteria of High for scores ≥45, Medium for 30<scores<45, and Low for scores ≤30. Based on the above criteria, the number of samples in the Upper and Lower teacher competency groups is compiled in the following table:

Table 1. Social-Emotional Grouping Based on Criteria

Teacher Competency Group	Criteria		
	Height	Medium	Low
Top	41	42	21
Lower	39	47	17

The post-test results of the students are compiled in the following table:

Table 2. Summary of Research Data

Teacher Competency Group: Lower				Total
N	39	47	17	103
Total X_i	3.185	3.785	1.325	8.295
Averages	81.67	80.53	77.94	240,14
Total $(X_i)^2$	261.825	307.225	103.725	672.775
C	260.108,33	304.813,30	103.272.06	668.193,69
SS	1.716,67	2.411,70	452,94	4.581,31
Teacher Competency Group: Top				
N	41	42	21	104
Total X_i	3.715	3.765	1.795	9.275
Averages	90.61	89.64	85.48	265,73
Total $(X_i)^2$	338.475	339.575	154.375	832.425
C	336.615,24	337.505,36	153.429,76	827.550,36
SS	1.859,76	2.069,64	945.24	4.874,64

$$C = \frac{(\sum X)^2}{n} \quad dan \; SS = \sum X^2 - C$$

The average post-test results for mathematics for students based on social-emotional competency criteria are compiled in the following table:

Table 3. Average and Number of Average

Teacher Competency Group	Social Emotional Competition				
	Height	Medium	Low	Total	
Top	90,61	89,643	85,476	265,73	A1
Lower	81,667	80,532	77,941	240,14	A2
Total	172,28	170,17	163,42	505,87	G
	B1	B2	B3		

The post-test results were processed to find the sum of squares (SS), degrees of freedom (df), mean square (MS), and F value. The results of the data processing calculations are summarized in the following table:

Table 4. Summary of Two-Way Analysis of Variance for Unequal Cells

	JK	Dk	RK	$F_{account}$	F_{table}	Result
Teacher Competency (B)	4253,58	1	4253,58	90,416	3,84	Rejected H_{oB}

Social Emotional Competition (A)	835,14	2	417,57	28,605	3,00	Rejected H_{oA}
Interaction (BA)	29,20	2	14,60	0,310	3,00	Accepted H_{oBA}
Galat	9455,95	201	47.05	--	--	--
Total	14573,87	206	--	--	--	--

Test decision: Rejected H_{oB}; Rejected H_{oA}; and Accepted H_{oBA}

In addition to statistical significance testing, the magnitude of the effects indicates that teacher professional competence and students' social-emotional competence contributed substantively to variance in conceptual understanding. This finding suggests that the observed differences are not only statistically significant but also meaningful in educational practice, particularly in strengthening conceptual learning in elementary mathematics.

Conclusion

1) There is a difference in the competence of teachers in the Upper group and the Lower group in mathematics learning in terms of understanding mathematical concepts.
2) There is a difference in the influence of social-emotional abilities for all criteria in mathematics learning in terms of understanding mathematical concepts.
3) There is no interaction between teacher competence and social-emotional skills in mathematics learning on mathematical concept understanding.

The results of the two-way analysis of variance with unequal cells were followed up with Scheffe's test. The follow-up results are presented in the table below.

Table 5. Means of Each Cell from the Data

	Social Emotional Competition (A)			Marginal Averages
Teacher Competency Group (B)	Height (a1)	Medium (a2)	Low (a3)	
Height (b1)	90,61	89,64	85,48	88,58
Lower (b2)	81,67	80,53	77,94	80,05
Marginal Averages	86,14	85,09	81,71	

Scheffe's test results for column comparisons are as follows:

Comparison of column 1 with column 2:

$$F_{1-2} = \frac{(86,14-85,09)^2}{(47,05)\left(\frac{1}{80}+\frac{1}{89}\right)}$$

$$F_{1-2} = 0,989$$

Comparison of column 1 with column 2:

$$F_{2-3} = \frac{(85,09-81,71)^2}{(47,05)\left(\frac{1}{89}+\frac{1}{38}\right)}$$

$$F_{2-3} = 6,462$$

Comparison of column 1 with column 2:

$$F_{1-3} = \frac{(86{,}14 - 81{,}71)^2}{(47{,}05)\left(\frac{1}{80}+\frac{1}{38}\right)}$$

$$F_{1-3} = 10{,}745$$

Critical Areas: $DK = \{F\ I\ F > F_{(0.05,2,201}\} = \{F\ I\ F > 3.00\}$

Decision

There is at least one calculated F value greater than the table F value (3.00), thus rejecting Ho and accepting H1, namely that there is a significant difference in the mean between social-emotional criteria and mathematical concept understanding.

Test conclusion

High (H) social-emotional ability is as effective as moderate (M) social-emotional ability in mathematics learning. Social-emotional abilities with High (H) criteria are more effective than those with Low (L) criteria, and social-emotional abilities with Medium (M) criteria are more effective than those with Low (L) criteria in mathematics learning.

Discussion

The effect on mathematical concept understanding for the two teacher competency groups differed after follow-up testing. The marginal mean of the teacher competency group with the Above criterion (88.58) was higher than that of the teacher competency group with the Below criterion. This indicates that students taught by teachers from the teacher competency group with the Above criterion performed better in developing mathematical concept understanding. The superiority of the teacher competency group with the criteria Above compared to the teacher competency group with the criteria Above can be seen from their learning activities, namely: the selection of learning models that suit the characteristics of the students, the ability to relate the concepts before the material is taught to the material to be taught, and the ability to relate mathematical concepts to concepts of problems that exist in the students' environment. Meanwhile, the group of teachers with Lower competency criteria tended to reinforce concepts through guided practice, independent practice by providing students with worksheets, and providing techniques for memorizing formulas.

Students have a better understanding of the mathematical concepts taught by teachers in the teacher competency group with the criteria of "Above," in accordance with the concept of Bellibaş, M. Ş., Gümüş, S., & Liu, Y. (2021) explaining that teachers who have teacher competence for aspects of making teachers competent in designing more effective learning because they are able to choose and set learning models and the necessary media, master the material in depth because they are able to link concepts in mathematics and mathematical concepts with social concepts, and develop themselves sustainably because they always want to learn. This is also reinforced by the concept of Danim, S. (2020), which explains that teachers who have professional teacher competence will be able to improve the quality of learning, help students prepare for the future, and increase parental trust. This is also reinforced by the concept from Danim, S. (2020), which explains that teachers who have professional teaching competencies will be able to improve the quality of

learning, help students prepare for the future, and increase the trust of parents and the community in education.

Goodwin, A. L. (2021) explains that teachers who possess the professional aspects of teacher competence are able to improve the quality of learning, as evidenced by their ability to design and implement more effective and systematic learning, develop teaching materials creatively and relevantly to the context of life in society, and develop an appropriate and measurable assessment system for conceptual understanding. Menter, I., & Assunção Flores, M. (2021) explain that teachers who have professional aspects of teacher competence will be able to improve student achievement and preparation, which is characterized by helping students achieve learning objectives better, preparing them to face future challenges by equipping them with relevant knowledge, and diagnosing students'learning difficulties and providing more effective guidance. Based on this explanation, it can be concluded that teachers who have professional teaching competencies will be able to plan, implement, and evaluate mathematics learning programs well so that they can achieve their goal of improving mathematics comprehension.

Social-emotional competencies for each criterion differ in terms of critical thinking development. This is demonstrated by statistical calculations, where the calculated F (28.605) is greater than the table F (3.00). Social-emotional competencies with High (H) and Medium (M) criteria are equally effective in developing critical thinking skills. Social-emotional abilities with High (H) and Medium (M) criteria are more effective than Low (L) criteria. This is evidenced by the results of follow-up calculations from the comparison between columns, namely: column one with column two obtained data that F1-2 (0.874) is smaller than F table (3.00), column two with column three shows that F2-3 (6.462) is greater than F table (3.00), and F1-3 (10.795) is greater than F table (3.00). The effectiveness between students who have high (T) with a Medium (M) rating due to the emergence of indicators such as: students' motivation to interact or communicate with other students, the courage to propose ideas for problem solving, the motivation to pay attention to what the teacher is teaching, and the courage to try to do exercises. These indicators are a form of self-control in students who have social-emotional competencies with High (H) and Medium (M) criteria. This is in line with the concept explained by Nurhayati et al. (2023) that students who have good social-emotional competence can understand, manage, and express various emotions, and improve relationships with others in their environment. Nugraha and Rachmawati (2021) explained that students with good social-emotional competence can understand and manage emotions, build social relationships, adapt to the environment, and achieve a balance between emotional, social, and physical aspects in life. This is also in line with the theory of Soto, Napolitano, Sewell, Yoon, & Roberts (2024) explaining that social emotional competence in learning at school can improve self-awareness and self-confidence, better manage emotions and stress, build healthy and effective relationships with others, make responsible decisions, and improve academic achievement and reduce behavioral problems.

Students with low social-emotional competence (R) tend to be passive at the beginning of learning. This is because their social-emotional skills are not yet able to adapt to contributing statements or brief explanations that support mathematical concepts, resulting in slow analysis and finding solutions to mathematical problems given by teachers. In addition, their slowness in determining solution ideas results in slow support for the application of reliable basic mathematical concepts. This is in line with Danim's (2011: 192) concept, which explains that students with social competence should be able to adapt to social interactions, achieve personal goals, and maintain positive relationships with others in different situations. Meanwhile, the theory from Nakamichi, K., Nakamichi, N., & Nakazawa, J. (2021) explains that understanding emotions and conflicts constructively, these competencies can help reduce detrimental behavior and discipline problems in the classroom, and the ability to understand the feelings of others and appreciate differences creates a more harmonious and inclusive environment.

Based on the above description, it can be concluded that the social-emotional abilities possessed by students with High (H) and Medium (M) criteria have the same effective influence, but are better than those with Low (L) criteria in developing critical thinking skills. This is because social-emotional competence can differentiate interactions between students in mathematics learning, which contributes to their ability to analyze and find solutions to problems given by teachers.

This study has limitations in that students were nested within teacher groups, which may involve clustering effects not fully captured through two-way ANOVA. Although the analysis was appropriate for the factorial design employed, future studies may consider multilevel modeling approaches to account for hierarchical data structures and provide more robust estimates of teacher-level effects.

CONCLUSION

The results of the study conclude that teachers who have professional teaching competencies with criteria Above are better than teachers who have professional teaching competencies with criteria Below. This is because teachers with Above criteria competencies are more capable of planning, implementing, and evaluating mathematics learning programs well so that they are able to achieve their goals, namely improving mathematics understanding.

The social-emotional abilities of students with High (H) and Medium (M) criteria have the same effective influence on mathematics learning in terms of mathematical concept understanding, but they are better than those with Low (L) criteria in terms of mathematical concept understanding. This is because social-emotional competence can differentiate interactions between students in mathematics learning, which contributes to the ability to analyze and find solutions to problems given by the teacher.

ADVICE

The results showed that the professional competence of teachers in understanding the structure of mathematics provide benefits on how to choose and establish learning models and establish learning methods. The suggestion for the next research is how these findings provide inspiration to find elementary school mathematics learning that starts from concrete to abstract.

Social-emotional competence is able to contribute to the learning of mathematics in improving understanding of concepts, so it is necessary to conduct specific research on the characteristics of learners who are categorized to be associated with models and methods of learning mathematics in elementary school.

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