ISSN 2964-4291
https://proceeding.unnes.ac.id/index.php/iset

Analysis of the Creative Thinking Process of Kineesthetic Students in Solving Arritmatic Sequences and Series Problems with the Help of Congklak Media Based on Wallas Stages

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Abstract. This study aims to describe the creative thinking process of kinesthetic students in solving arithmetic sequences and series problems with the help of congklak media based on the Wallas stages. The research method used is descriptive qualitative. The subjects of this study consisted of four students of class XI MIPA 5 SMAN 3 Kuningan who were selected using a purposive sampling technique based on the highest kinesthetic learning style questionnaire score. Data was collected through questionnaires, tests, interviews, and observations. The triangulation used is time and technique triangulation. The results showed that: (a) at the preparation stage the four subjects were able to identify problems carefully, completely, and accurately; (b) at the incubation stage, one subject asked the researcher about the concept of an arithmetic sequence, this activity is a stage where the subject looks for a relationship between the concept of an arithmetic sequence and the information contained in the problem so that the subject is able to generate other solutions that are different from what the three thinkers think. another subject; (c) at the illumination stage, the four subjects have a strong will and effort to find alternative solutions to the problems given; and (d) at the verification stage, two subjects were able to get more than one alternative answer idea for each given question, while the other two subjects had not been able to find alternative ideas/other solutions to some of the questions given.

Keywords: Creative Thinking Based on Wallas Stages, Kinesthetic Students, Arithmetic Sequences and Series Problems, Congklak Media

How to Cite: Adiastuty, N., Waluya, B., Junaedi, I., Masrukan, M., Herayani, E., Nurhayati, N. (2022). Analysis of the Creative Thinking Process of Kineesthetic Students in Solving Arritmatic Sequences and Series Problems with the Help of Congklak Media Based on Wallas Stages. *ISET: International Conference on Science, Education and Technology* (2022), 1326-1333.

INTRODUCTION

One of the learning objectives in schools is to instill students' thinking habits, especially creative thinking in dealing with important issues.Creative thinking is an ability based on available data or information to find many possible answers to a problem, where the emphasis is on quantity, effectiveness, and diversity of answers.Munandar, 1999).There are four indicators of creative thinking, including: (1)fluency (fluency); (2) flexibility; (3) authenticity (originality); and (4) elaboration (elaboration).These four indicators are used as a reference for compiling creative thinking test instruments in this study.

In order to maximize creative thinking skills, of course we must know and understand how the process or flow of thinking of each student. The thinking process involves the ability to generate original ideas, to understand new and unexpected relationships, or to construct unique and improved orders between seemingly unrelated factors (Kargar et al., 2013)suggested that p. It is intended that students are able to understand, design, complete and interpret the solutions obtained based on the information and experience they have(Jagom et al., 2021). So, it can be said that pthe process of creative thinking is a series of activities to findvarious kinds of ideas or ideas in solving a problem.The guidelines used to determine students' creative thinking processes are creative thinking processes developed by Wallas which include four stages, namely: 1) Preparation, 2) Incubation, 3) Illumination, and 4) Verification.(Siswono, 2004). Wallas's creative thinking stage is used as a reference to measure creative thinking skills and to find out at what stage it is difficult for students to do.

Student learning styles affect how students absorb information, which will determine the

success of learning. Learning style is a student's habit in processing how to absorb information, experience, and students' habits in treating the experiences they have so that they can be used as a basis inherent in students.Sundayana, 2016). In general, there are 3 types of learning styles based on sensory preferences, namely based on sight, hearing, and touch/movement (De Porter & Hernacki, 1992). The research subjects selected in this study were students who had the highest kinesthetic learning style tendencies. Some characteristics of kinesthetic learners include speaking slowly, responding to physical attention, liking to touch others to get their attention, moving a lot, learning through practice and manipulation, memorizing by walking and looking, likes to use fingers as a pointer when reading, and cannot sitting still for long periods of time (De Porter & Hernacki, 1992).

There are many choices of learning media that can be used in learning mathematics, but not all learning media are suitable for use, but must be adapted to the needs (objectives, materials, and students). This matterrequires teachers to be able to provide tools in the form of learning media that support the learning process according to the characteristics of students. Traditional game media, one of which is Congklak, has proven to be effective in making students more actively involved in teaching and learning activities.Iswinarti, 2010). Congklak is one of the traditional game mediain the form of a perforated board where the game is played by filling holes or hollows with seeds according to certain rulesthat can be used in learning mathematics, one of which is in the material of arithmetic sequences and series.

Based on the 2013 Curriculum High School Syllabus that one of the materials taught in class XI in the Compulsory Mathematics subject is arithmetic sequences and series. However, based on the results of research conducted bySeptiahani et al. (2020)shows that in working on the problems of the SMK ranks and series are still relatively low. The results of research conducted byHandayani et al. (2020)shows that the types of errors that students make in solving arithmetic sequences and series story problems are conceptual errors, errors using data, language interpretation errors, technical errors, and drawing conclusions.

Based on several previous studies that examine the relationship between differences in characteristics and students' creative thinking processes, such as research conducted byAziz (2014)which shows that there are differences in student characteristics in terms of the Myer-Briggs dimension personality type in each stage of the creative thinking process.Setiawani et al. (2017)in his research showed differences in the characteristics of kinesthetic students in each stage of the creative thinking process. Based on this background and realizing that there are differences in the characteristics of each student and the lack of media use in conveying arithmetic sequences and series material, in this study the researchers conducted a study to analyze the creative thinking process of kinesthetic students in solving arithmetic sequences and series problems with the help of Congklak media based on wallas stages.

THEORITICAL REVIEW

Creative Thinking

Munandar (1999)The definition of creative thinking is the ability based on available data or information to find many possible answers to a problem, where the emphasis is on quantity, effectiveness, and diversity of answers.Ulfa (2018) states that the characteristics of creative thinking consist of 4 aspects, namely fluency (fluency), flexibility (flexibility), originality (authenticity), and elaboration (details) in thinking.

Creative thinking in question includes indicators: (1)fluency, solving arithmetic sequences and series problems with a variety of solution ideas presented completely and accurately; (2) flexibility, solving arithmetic sequences and series problems with a variety of answers/various ways that are presented completely and accurately; (3) originality, solving arithmetic sequences and series problems in their own way; and (4) elaboration, developing ideas for solving arithmetic sequences and series problems in detail.

Creative Thinking Process

Munjayanah (2016) means that the creative thinking process is a creative thinking process in solving mathematical problems which includes the stages of synthesizing ideas, building ideas, planning the application of ideas, and applying ideas to produce new products.The creative thinking process referred to is based on the stages proposed by Wallas, which includes several stages such as: (1) the preparation stage, namely the stage of problem solving by collecting data, seeking approaches and solutions; 2) the

incubation stage, namely the initial stage of the process of the emergence of new inspiration and discoveries; 3) the illumination stage, namely the stage where someone gets a problem from new ideas and ideas; and 4) verification stage, the stage where someone tests and checks problem solving.

Kinesthetic Learning Style

De Porter & Hernacki (1992) suggested that gLearning style is a combination of how it absorbs, organizes and processes information.Saputri (2016)suggests that there are 3 kinds of learning styles, namely visual, auditory and kinesthetic.The subjects in this study were students with a kinesthetic learning style. Students with a kinesthetic learning style usually have the characteristics of speaking slowly, responding to physical attention, likes to touch others to get their attention, moves a lot, learns through practice and manipulation, memorizes by walking and looking, likes to use fingers as a pointer when reading , and cannot sit still for long periods of time (De Porter & Hernacki, 1992). Therefore,Students with this learning style are easier to catch the lesson when they move, touch, or take action.

Arithmetic Sequences and Series

Sequence is a list of sequences of numbers that are usually written from left to right that have certain characteristics or patterns. An arithmetic sequence is a sequence of numbers with a fixed pattern, based on addition and subtraction operations. The difference between two terms in an arithmetic sequence is calleddifference or difference denoted by .b

A series is the sum of the elements in a sequence. The arithmetic series symbolized by is the sum of the first terms of the arithmetic sequence. Arithmetic series can also be interpreted as the sum of the terms of an arithmetic sequence.$S_n n$

Congklak Game Media Integrated Question Card

Congklak is a traditional game medium, in the form of a perforated board which is played by filling holes or hollows with seeds according to certain rules. The congklak used in this study is congklak which has modified its usage rules by integrating variations of question cards.

The holes on the congklak board are used to represent each term in the arithmetic sequence. Meanwhile, the congklak seeds are used to state the number of numbers in each term in the arithmetic sequence and the question card contains various variations of the number sequence to help students understand the concepts of arithmetic sequences and series.

METODS

Types of research

The type of research conducted in this study is a qualitative research using a descriptive approach.

Research Time and Place

This research was conducted at SMA Negeri 3 Kuningan on 10-16 June 2021 in the even semester of the 2020/2021 academic year.

Research subject

The class of research subjects taken was class XI MIPA 5, totaling 29 students at SMA Negeri 3 Kuningan. Taking research subjects using purposive sampling technique. The subjects selected in this study were four students with the highest kinesthetic learning style scores based on the results of the learning style classification questionnaire. Students who have been selected as research subjects are given a creative thinking test in the form of a description of the matter of arithmetic sequences and series with the help of congklak media. The answers presented by the students were then analyzed based on the indicators of the creative thinking process according to Wallas theory.

Procedure

This research was conducted in three stages, namely: planning, implementation, and completion stages. The planning stage includes submitting topics, preparing proposals, compiling instruments, licensing, and testing instruments which are carried out in the range of December 2020 to June 2021. The implementation stage of research activities includes giving questionnaires for classifying learning styles, creative thinking tests with the help of congklak media, interviews , and observations carried out in June 2021. The completion stage includes data analysis activities and preparation of research reports which are carried out in the range of June to August 2021.

Data Collection Techniques and Data Analysis Techniques

The data analysis used in this study was carried out qualitatively, including data collection, data reduction, data presentation, data credibility, and drawing conclusions.

RESULTS AND DISCUSSION

This research begins with the provision of a learning style classification questionnaire conducted online using the Google Form application platform which was conducted on Thursday, June 10, 2021. Learning style classification questionnairewhich are givenconsists of 27 statement items to determine the tendency of learning stylesvisual, auditory, and kinesthetic. Based on the analysis of the results of the learning style classification questionnaire given to students of class XI MIPA 5 that of 29 students there were6 students have a visual learning style tendency, 11 students have an auditory learning style tendency, and 12 students have a kinesthetic learning style tendency.

The subjects in this study consisted of 4 students who were taken from 12 students who had a kinesthetic learning style tendency. This is based on the results of the questionnaire scores on the classification of the highest kinesthetic student learning styles.Furthermore, the four selected subjects were given creative thinking test questions for arithmetic sequences and series with the help of congklak media. The provision of creative thinking test questions is given on Tuesday, June 15, 2021. The questions presented in the test consist of 3 questions that contain indicators of creative thinking, namely*fluency*, flexibility, originality, and elaboration based on the Wallas stages which had previously been tested for validity and reliability.

Researchers directly observed students while working on creative thinking test questions on arithmetic sequences and series material with the help of congklak media by referring to the observation guidelines that had been prepared. The research was continued with interviews conducted online through the WhatsApp application platform to four selected subjects guided by the interview sheet. It aims to explore students' creative thinking processes in solving arithmetic sequences and series questions, which may not be written on the answer sheet.

Based on the results of written tests, interviews, and observations that the stages of the creative thinking process of each kinesthetic student vary. The following are the stages of the creative thinking process for the initial subjects AV, BCI, FSR, and IDA:

Creative Thinking Process of Kinesthetic Students Subject Initials AV

The preparation stage, at this stage the AV subject is able to understand the problem the first time he reads it, triggers many statements on the problem by writing what is known and asked in a smooth, detailed, structured, and systematic way, states the problem with mathematical examples, formulates a unique concept of elements the arithmetic sequence given, linking the problem with the congklak media, and already having a plan in solving the problem, this is in line with the results of research that has been carried out byAprianti et al. (2020)revealed that kinesthetic students were able to understand the questions well and were able to make plans in solving the problems given.

Incubation stage, at this stage the subject of AV contemplates trying to organize concepts or facts to find further ideas while playing with a pen. This stage is the stage where the subject allows the mind to rest and try to come up with ideas, this is in line with the results of research conducted byAmalia & Suratman (2015)who argues that the incubation stage is the stage where students have the potential to come up with many ideas. When working on question number 2, AV subject also had time to ask the researcher "Can the terms in the arithmetic sequence be negative?". This is in line with the research resultsSari (2014)argues that the incubation stage is the stage where students construct a relationship of ideas to the completion of the ideas that they have gotten before. Next, the AV subject represented the idea by dividing the congklak seeds into each hole,but the process is not coherent and is still at the trial and error stage, this is in line with what was expressed bySaputri (2016)which suggests that kinesthetic students use real subjects as learning aids.

Illumination stage, at this stage the AV subject is able to pass well and succeed in writing alternative solutions even though when working on questions number 1 and 2 it takes a long time to find patterns and think of alternative solutions to get the final result right, this is in line with the results of the research conducted. ever done bySetiawani et al. (2017)that students with kinesthetic learning styles have the effort and willpower to solve the problems that have been studied. The AV subject at this stage did not write in detail the steps he took in finding alternative answers to questions number 1 and 2, but the steps in finding various alternative answers could be seen during the observation process and were able to be explained during the interview process. , this is in line with the results of research conducted byNingsih (2021)that kinesthetic

students have not been able to develop and describe an idea by taking steps to solve problems in detail and systematically. AV subjects also tried to link the previous answers to be able to find other alternative answers.

Verification stage, at this stage the AV subject is able to find alternative ideas/other ways to solve the problem for each given question, one of the answers written by the AV subject, namely the answer to question number 2 appears an answer that meets the originality indicator where the written answer is unique and different from the answers written by other subjects, but in questions number 1 and 2, AV subjects did not write down in detail the steps involved in finding the alternative answers. However, AV subjects always re-examine the results of the answers that have been written, this is in line with the results of research that has been done bySetiawani et al. (2017)that students with kinesthetic learning styles re-examine the results obtained in accordance with the data known in the problem.

Kinesthetic Student's Creative Thinking Process Subject Initials BCI

The preparation stage, at this stage the BCI subject is able to understand the problem after reading it several times, triggers many statements on the question by writing what is known and asked fluently, but less structured, states the problem in their own language, formulates general concepts and is the same as what is being said. written by another subject from the elements of the arithmetic sequence given, trying to relate the problem to congklak media and mathematical equations, and already having a plan in solving the problem, this shows that the BCI subject is able to look at problems, identify problems and formulate problems, this is in line with the results of research that has been carried out byAprianti et al. (2020)Kinesthetic students are able to understand the questions well and are able to make plans in solving the problems given.

Incubation stage, at this stage the BCI subject contemplates trying to organize concepts or facts to find further ideas while and unconsciously fiddling with their fingers, this is in line with the results of research that has been done byAmalia & Suratman (2015)who argues that the incubation stage is the stage where students have the potential to come up with many ideas. Correspondingly,Sari (2014)argues that the incubation stage is the stage where students construct a relationship of ideas to the completion of the ideas that they have gotten before. BCI subjects at this stage did the activity of doodling on opaque paper to write down the results of their thoughts, this is in line with what Haviz (2020) stated that kinesthetic students use learning aids to emphasize concepts or keys. Then, the subject represented the scribbles on the opaque paper to the congklak media by dividing the congklak seeds into each hole,but the process is not coherent and is still in the trial and error stage, this is in line with what was expressedSaputri (2016)which suggests that kinesthetic students use real subjects as learning aids.

Illumination stage, at this stage the subject is able to pass well and succeed in finding alternative solutions, although for questions number 1 and 2 it must take time to think about the solution in order to get the final result right. The BCI subject at this stage did not write down in detail the steps he took in finding alternative answers to question number 1, this is in line with the results of research conducted byNingsih (2021)that kinesthetic students have not been able to develop and describe an idea by taking steps to solve problems in detail and systematically. However, he conveyed these steps during the interview process and was seen during the observation process. BCI subjects also always try to relate the previous answers to be able to find alternative answers.

The verification stage, at this stage the BCI subject is able to find alternative ideas/other ways on questions no. 1 and 3. However, from the results of the answers that have been written by the BCI subjects, new or different answers from the answers written by other subjects have not emerged. It can also be seen on the answer sheet for question no. 1, that the BCI subject did not write down in detail the steps he took to find alternative answers to the question. However, the BCI subject at this stage always re-examines the results of the written answers, this is in line with what was expressed bySetiawani et al. (2017)that students with kinesthetic learning styles re-examine the results obtained in accordance with the data known in the problem.

Creative Thinking Process of Kinesthetic Students Subject Initials FSR

The preparation stage, at this stage the FSR subject is able to understand the problem after reading it several times, triggers many statements on the question by writing down what is known and asked but is not structured and systematic, states the problem in their own language, formulates general concepts and is the same as

what was written by other subjects from the elements of the arithmetic sequence given, trying to relate the problem to congklak media and mathematical equations, and already having a plan in solving the problem, this is in line with the results of research that has been carried out byAprianti et al. (2020)Kinesthetic students are able to understand the questions well and are able to make plans in solving the problems given.

Incubation stage, at this stage the subject of FSR contemplates trying to organize concepts or facts to find further ideas while playing with congklak seeds in his hands. This stage is a step where the subject allows the mind to rest and try to come up with ideas, this is in line with the results of research conducted byAmalia & Suratman (2015)who argues that the incubation stage is the stage where students have the potential to come up with many ideas. Correspondingly,Sari (2014)argues that the incubation stage is the stage where students construct a relationship of ideas to the completion of the ideas that they have gotten before. Furthermore, the subject of FSR represented the idea obtained by trying to divide the congklak seeds into each hole, this is in line with the results of research that has been done bySaputri (2016)the results show that kinesthetic students use real subjects as learning aids.

Illumination stage, at this stage the subject passes well and succeeds in writing alternative solutions even though it must take time to think about the completion in order to get the final result right. The FSR subject at this stage did not write down in detail the steps he took in finding alternative answers in the first stage, this is in line with the results of research conducted byNingsih (2021)that kinesthetic students have not been able to develop and describe an idea by taking steps to solve problems in detail and systematically. However, he conveyed these steps during the interview process and was seen during the observation process. FSR subjects also tried to relate the previous answers to be able to find alternative answers.

Verification stage, at this stage the FSR subject is able to find alternative ideas/other ways on questions no. 1 and 3. However, from the answers that have been written by the FSR subject, new answers or different answers from other subjects have not emerged. It can also be seen on the answer sheet for question no. 1, that the subject of FSR did not write down in detail the steps he took to be able to find alternative answers to the question. However, the FSR subject always rechecks the results of the answers that have been written, this is in line with what was expressed bySetiawani et al. (2017)which suggests that students with kinesthetic learning styles re-examine the written solution and the results obtained are in accordance with the data known in the problem.

Kinesthetic Student's Creative Thinking Process Subject Initials IDA

The preparation stage, at this stage the IDA subject is able to understand the problem after reading it several times while pointing at the question with his finger, this is in line with what was expressed byDe Porter & Hernacki (1992)that one of the characteristics of students with a kinesthetic learning style is to use the finger as a pointer when reading. The subject of IDA triggers many statements on the problem by writing what is known and asked in a smooth, detailed, structured, and systematic way, stating the problem with mathematical examples, formulating a general and the same concept from the elements of the arithmetic sequence given, linking the problem with congklak media, then write down every step what is known and asked, this shows that IDA subjects have been able to look at problems, identify problems and have a resolution plan, in line with the results of research that has been done byAprianti et al. (2020)which revealed that kinesthetic students were able to understand the questions well and were able to make plans in solving the problems given.

Incubation stage, at this stage the IDA subject contemplates and is silent for a moment then rereads the question trying to organize concepts or facts to find ideas. This stage is a step where the subject allows the mind to rest and try to come up with ideas, this is in line with the results of research conducted byAmalia & Suratman (2015)who argues that the incubation stage is the stage where students have the potential to come up with many ideas. Correspondingly,Sari (2014)argues that the incubation stage is the stage where students construct a relationship of ideas to the completion of the ideas that they have gotten before. Next, IDA Subjects represented the idea by dividing the congklak seeds into each hole,but the process is not coherent and is still at the trial and error stage, this is in line with what was expressed bySaputri (2016)which suggests that kinesthetic students use real subjects as learning aids.

Illumination stage, at this stage the subject passes well, by successfully writing several

alternative solutions even though it must take time to think about the completion in order to get the final result right, this is in line with the results of research that has been done bySetiawani et al. (2017)that students with kinesthetic learning styles have the effort and willpower to solve the problems that have been studied. The IDA subject at this stage did not write down in detail the steps he took in finding alternative answers in the first and second stages, this is in line with the results of research conducted byNingsih (2021)that kinesthetic students have not been able to develop and describe an idea by taking steps to solve problems in detail and systematically. However, he conveyed these steps during the interview process and was seen during the observation process. IDA subjects also tried to relate the previous answers to be able to find alternative answers.

Verification stage, at this stage the IDA subject is able to find other ways/ideas in solving problems for each given question. However, from the results of the answers that have been successfully written by the IDA subjects, new or different answers have not emerged from the answers written by other subjects. It can also be seen in the answer sheet for question no. 1, that the subject of IDA did not write down in detail the steps he took to be able to find alternative answers to the question. However, IDA subjects always re-examine the results of the answers that have been written, this is in line with the results of research that has been carried out bySetiawani et al. (2017)that students with kinesthetic learning styles re-examine the results obtained in accordance with the data known in the problem.

CONCLUSIONS

The four subjects at the preparation stage were able to explore the information known in the questions carefully, completely, and precisely and were able to identify the problems asked properly. The four subjects in the incubation stage shifted their attention when looking for solution ideas in different ways, including: one subject distracts by trying to write initial information on a piece of paper, two subjects distract by playing with objects around them, and one other subjects thought about the solution while muttering and when reading the questions without realizing he always pointed at the questions with his finger. One of the four subjects at this stage had asked the researcher regarding question no 2 that "can the terms in the arithmetic sequence be negative?", This shows that the subject is trying to find a relationship about the concept of an arithmetic sequence so that a solution idea that is unique and different from what other subjects think. The four subjects at the illumination stage tried to find alternative ways/ideas with the help of congklak media, although the steps taken were not coherent and still at the trial stage. This shows that the four subjects have the effort and willpower to solve the problem, and are able to get alternative solutions with the correct final answer. However, the four subjects did not write down in detail the completion steps to be able to find the answer to question no 2. Two subjects at the verification stage were able to find other ways/ideas from each of the questions given but the other two subjects had not been able to find more than one alternative way/other ideas from question no 2. Based on the test results given, only one of the four subjects which is able to bring up answers that meet the originality indicator, namely answers that are unique and different from answers written by other subjects. However, it appears that the four subjects always re-examine the results of the answers that have been written.

REFERENCES

Amalia, A., & Suratman, D. (2015). Students' Creative Thinking Process in Solving the Problem of Building Room Based on the Wallas Stages In SMP. 1–10.

Aprianti, BD, Sucipto, L., Riska, K., & Kurniawati, A. (2020). Analysis of math problem solving ability of class VIII based on students' learning styles. Paedogoria: Journal of Educational Studies, Research, and Development, 11(3), 289–296. http;//journal.ummat.ac.id/index.php/paedagoria

Aziz, A. (2014). Creative Thinking Process in Solving Mathematical Problems in terms of Personality Type Dimensions of Myer-Briggs Grade VIII students at MTs NW Suralaga, East Lombok Regency, 2013/2014 academic year. UNS (Sebelas Maret University).

De Porter, B., & Hernacki, M. (1992). Quantum learning. PT Mizan Publica.

Handayani, T., Hartatiana, H., & Muslimahayati, M. (2020). Analysis of Student Errors in Solving Story Problems with Arithmetic Sequences and Sequences. PHI: Journal of Mathematics Education, 4(2), 160–168.

Iswinarti, I. (2010). Therapeutic Values of Traditional Engklek Games in Elementary

School Age Children. Muhammadiyah University Malang.

Jagom, YO, Uskono, IV, Dosinaeng, WBN, & Lakapu, M. (2021). The Creative Thinking Process of Middle School Students in Solving Mathematical Problems Based on Learning Styles. Scholar's Journal: Journal of Mathematics Education, 5(1), 682–691. https://doi.org/10.31004/cendekia.v5i1.308

Kargar, FR, Ajilchi, B., Goreyshi, MK, & Noohi, S. (2013). Effect of creative and critical thinking skills teaching on identity styles and general health in adolescents. Procedia-Social and Behavioral Sciences, 84, 464–469.

Maharani, A., & Wahyuni, I. (2019). Error Analysis in Solving Sequences and Series Problems Based on Watson's Categories. Echoes of Wiralodra, 10(2), 254–263.

Munandar, U. (1999). Develop the talents and creativity of school children. Jakarta: Gramedia.

Ningsih, EF (2021). Profile of Creative Thinking of Class VIII Junior High School Students in Solving Quadrilateral Problems From a Learning Style. KadikmA, 12(1), 34. https://doi.org/10.19184/kdma.v12i1.22884

Saputri, FI (2016). The Influence of Visual, Auditory, and Kinesthetic Learning Styles on Students' Learning Achievement. Prima Edukasia Journal, 3(01), 25–36.

Sari, AK (2014). Analysis of the characteristics of learning styles (visual, auditory, kinesthetic) of informatics education students batch 2014. Edutic-Scientific Journal of Informatics Education, 1(1).

Septiahani, A., Melisari, M., & Zanthy, LS (2020). Error Analysis of Vocational High School Students in Solving Sequences and Series Problems. Mosharafa: Journal of Mathematics Education, 9(2), 311–322.

Setiawani, S., Syafitriyah, D., & Oktavianingtyas, E. (2017). Analysis of kinesthetic students' creative thinking processes in solving mathematical problems based on wallas stages. KadikmA, 8(1), 62–71.

Siswono, E. (2004). Identification of Students' Creative Thinking Process in Proposing Problems (Problem Posing) Guided Mathematics with Wallas Model and Creative Problem Solving (CPS). Mathematics Education Bulletin, 6, 1–16.

Sundayana, R. (2016). The Relationship between Learning Style, Learning Independence, and Problem Solving Ability of Junior High School Students in Mathematics Lessons. 75–84.