Profile of Mathematics Problem Solving of SMA IT Qurrota A'yun Sigi in terms of Spiritual Quotient (SQ)

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This research is a qualitative research to describe the profile of mathematics problem solving of SMA IT Qurrota A'yun Sigi students in terms of spiritual Quotient according to the stages of problem solving according to Polya. The research subjects were selected based on the results of the spiritual quotient test which consisted of three categories, namely the high category of SSQT initials, the medium category of SSQR initials, and the low category of SSQR. The results showed that the profile of students' mathematics problem solving (1) SSQT: a) understand the problem: be able to understand and interpret the problem calmly and be very concentrated and always confident in the answer. b) Develop a plan: SSQT is able to apply the knowledge possessed, can explain well the problem solving plan c) Implement the plan: SSQT consistently carries out according to plan and can use previously learned concepts and is fluent in operating arithmetic sequence and series formulas d) Re-checking: SSQT believes the answers obtained are correct and are serious about finding out the correctness of the answers obtained by re-testing the answer. (2) SSQS: a) Understanding the problem: SSQS is hesitant in solving problems and lacks understanding of problems so they are unsure of the answers. b) draw up a plan: SSQS can apply previous knowledge about arithmetic sequences and series, can explain problem-solving plans, is able to plan problem-solving but still has doubts about the plans that have been made. c) implement the plan: SSQS consistently implements according to plan, but still doubtful in carrying out the plan, able to solve using formulas and do not understand solving using other methods. d) Re-checking: SSQS hesitates in solving a problem but is able to re-check the answer. (3) SSQR: a) Understanding the problem: SSQR can identify information from the problem, but is unable to interpret the problem given by the researcher. b) develop a plan: SSQR cannot apply previous knowledge and cannot interpret the problem properly. c) carry out the plan: SSQR cannot apply the knowledge possessed, cannot apply the concept of problem solving, and when solving problems, SSQR does not use formulas, but always does it in its own way but the results obtained are not correct, d) re-check: the reason is that I don't know how to do it anymore and my abilities only end there.

keyword : Profile, Mathematics Problem Solving ,Spiritual Quotient

I. INTRODUCTION

Every human being is never apart from a problem in everyday life and every human being has different abilities in overcoming a problem. According to Polya [1] problem solving is an attempt to find a way out of a difficulty and achieve goals that cannot be achieved immediately. Or in other words, problem solving is a process of how to overcome a problem or question that is challenging in nature which cannot be solved by routine procedures that are commonly done/are known.

In solving mathematical problems, Polya steps are most often used in solving mathematical problems, because of their simple nature. This is in line with opinion[2]that the problem solving phases according to Polya are more popularly used in solving mathematical problems due to several reasons, including the phases in the problem solving process are not complicated, the activities in each phase are easy to understand and are commonly used in solving mathematical problems. In solving the problem of Polya[3] argues that there are four steps to solving the problem, namely; (1) understand the problem (understand the problem), (2) make a solution plan (devise a plan), (3) carry out the plan (carry out the plan), (4) check again (looking back).

From the results of interviews with IT Qurrota A'yun Sigi High School teachers, information was obtained that students had different abilities in solving problems, some were able to solve problems well and there were students who could not solve problems, the teacher stated that he had made efforts in learning, such as using teaching aids, applying learning models, but there are still students who have not been able to solve math problems correctly. This is what causes researchers to want to profile students' mathematical problem solving. Problems that are often encountered in everyday life one of which is the matter of Arithmetic Sequences and Series. In this material students find a lotquestions in the form of stories that describe the daily lives of students

Sukidi stated[4]In the world of education, IQ has a role as a processor of students' thinking abilities in solving difficult problems and requires reasoning as well as thinking and language skills, EQ becomes a supporting part in processing actions and behavior in teaching and learning activities, After intellectual Quotient and emotional Quotient, intelligence is found that is third, namely spiritual Quotient which is believed to be intelligence capable of functioning intellectual Quotient and emotional Quotient effectively and spiritual Quotient is the highest intelligence.

Rianik inside[5]argues that SQ gives the ability to find steps that are more meaningful and valuable among other steps. Because it is centered on spiritual space, so when owned it

will make it easier to solve a problem meaningfully.[5], in his research suggested that someone who has a high SQ is likely to be able to solve problems well, because in solving problems a person needs clear thinking so that he can understand a problem, clear thinking referred to in SQ is calm in thinking, so that he can solve problems well. According to[6]The ability of students to solve problems varies, there are those who are able to solve problems well and there are also students who are unable to solve problems. Likewise with the level of spiritual Quotient of students, there are those who have a high spiritual level, a moderate spiritual level, and a low spiritual level. Based on this explanation, there is a relationship between students' problem-solving abilities with different levels of students' spiritual Quotient. Prospective researchers are interested in conducting research with the title "Profile of Mathematics Problem Solving of Class XI Students of IT Qurrota A'yun Sigi High School in View of Spiritual Quotient.

II.   Method

This type of research is qualitative research. This study reveals scientifically by means of descriptions in the form of words and language about the profile of students' problem solving in solving Sequence and Series questions in terms of SQ level.

The research subjects were class XI students of SMA IT Qurrota A'yun Sigi for the 2021/2022 academic year. In determining the research subject, it was carried out using the SQ questionnaire developed by[7] in completing the final project (Thesis) entitled The Influence of Intellectual Quotient and Spiritual Quotient on Arabic Learning Achievement of MTS Sudirman Pracimantoro Wonogiri Academic Year 2015/2016. The questionnaire has been slightly modified and developed by the researcher. From the results of filling out the questionnaire, students were grouped and selected at least one subject who had high SQ, medium SQ and low SQ. This is as stated by Bungin [8]The selection of subjects in qualitative research is based on the assumption that it is not always necessary to examine all individuals in the population.

There are two types of research instruments, namely the main instrument and supporting instrument. Researchers as the main instrument, meaning that researchers act asobservers, interviewers, data collectors, and also prepare research reports, so the presence of researchers at the research location is very necessary. The supporting instruments in this study were: a) SQ Questionnaire Sheets b) Mathematical problem sheets designed by researchers in the form of description questions about Arithmetic Sequences and Series. c) Interview Guidelines to clarify students' answers in depth and to obtain more detailed information about how students work on questions and describe the problem-solving process.

The data analysis technique used in this study is the data analysis technique according to Miles and Hubeman in[9]namely a) Data Condensation includes: 1). Seeing the results of filling out the questionnaire and then grouping students into SQ level categories, 2) Correcting the results of student work that will be used to determine research subjects, 3) Conducting interviews with several research subjects and the results of the interviews are simplified to good and neat language arrangement. 4) remove unnecessary data to be included in the research results. b) Data Display includes: a) Presenting the results of the work

of students who have been selected as research subjects. (b) Presenting the results of interviews that have been recorded on a mobile phone. C) Conclusion Drawing Data verification and drawing conclusions are carried out during the analysis activities so that a final conclusion is obtained. The type of triangulation used in this research is time triangulation. Time triangulation is used for the validity of data relating to changes in a process and human behavior. Because human behavior changes from time to time. Data is said to be valid if there are many data similarities between the two sources, namely the results of written tests and interviews. Furthermore, valid data were analyzed to obtain information regarding the profile of students' mathematical problem solving in terms of SQ level.

III.   Results and Discussion

In this section, research data is presented, namely profile data for solving mathematical problems from student subjects in the categories of High SQ, Medium SQ and Low SQ in solving Arithmetic Sequences and Series problems based on Polya Steps, namely: 1) Understanding the Problem, 2) Developing a problem solving plan 3) Carry out problem solving, 4) Check back the results of the work.

This research was conducted in class XI SMA IT Qurrota A'yun Sigi for the 2022/2023 academic year. Students who were given a spiritual Quotient test were 29 people. The selection of subjects in this study was carried out by providing a spiritual Quotient questionnaire. The questionnaire used was a questionnaire that had been used by Munir, f (2016) then the content was validated by an expert Counseling Guidance lecturer on May 14, 2022, and 48 valid items were obtained. The validated spiritual quotient questionnaire was used for research at IT Qurrota A'yun Palu High School on June 5,6,9,10 2022. The results of the spiritual quotient test can be presented in table 4.1

Table 1 Results of students' spiritual quotient scores

No	Spiritual quotient level	Lots of students
1	High spiritual Quotient (SQT)	4 people
2	Medium spiritual Quotient (SQS)	22 people
3	Low spiritual in Quotient (SQR)	3 people

Based on table 1, information was obtained that of the 29 students who answered the spiritual Quotient questionnaire, there were 4 people with a high SQ level category, 22 people with a medium SQ level, and 3 people with a low SQ level.

Furthermore, the selection of research subjects was chosen from each category of spiritual Quotient. The selection of subjects was based on the highest score in each category and was also seen on report cards and considerations from teachers teaching in class XI about

students' ability to communicate and students' willingness to become research subjects.

Students who were selected as research subjects in the category of high spiritual quotient were given the initials SSQT, those in the category of medium spiritual quotient were given the initials SSQS and those in the category of low spiritual quotient were given the initials SSQR. The scores of students who were selected as research subjects for SSQT, SSQS, SSQR were 160, 128, 94 respectively, then SSQT, SSQS and SSQR were given math problem solving tests on June 5, 6, 9 and 10, 2022.

Presentation and analysis of data in this study began with data from interviews presented with each subject in solving problem 1 and problem 2 with problem-solving steps according to Polya. The data presented is then tested for data credibility and data analysis. The problems used in this study consist of two equivalent problems and have gone through an expert validation process. These problems are symbolized by M1 and M2.

A. SSQT Data Exposure and Analysis

In this section, exposure and analysis of SSQT data includes exposure and analysis of data in understanding problems, formulating plans, implementing plans, and re-checking the results of problem solving.

a). SSQT Data Exposure and Analysis in Understanding Problems

SSQT at the stage of understanding the problem answers calmly and confidently so that it focuses more on the problem given in the problem and can fully mention the information contained on the problem given by the researcher.

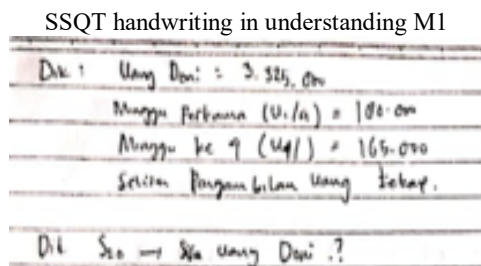SSQT handwriting in understanding M1

Figure 1 SSQT handwriting in understanding M1

The handwriting shows that SSQT can write down the information given in the questions, especially things that are known and asked, namely Doni's savings of Rp. 3,325,000.00. IDR 180,000 is taken the first week, 165,000 in the fourth week, the difference in withdrawing money each week is fixed and what is asked is how much money is left in Doni's savings after taking it for 20 weeks?

b) Stage of Developing a Problem Solving Plan

SSQT can apply previous knowledge. So that it can explain well the problem-solving plan, namely by making an example first then determining the formula that will be used to find the difference or difference, then determining the formula that will be used to find the amount of money taken until week 20, the last step is determining how to find the remaining money savings up to the 20th week by subtracting the initial deposit amount from the amount taken until the 20th week.

SSQT Handwriting in Compiling a Problem Solving Plan
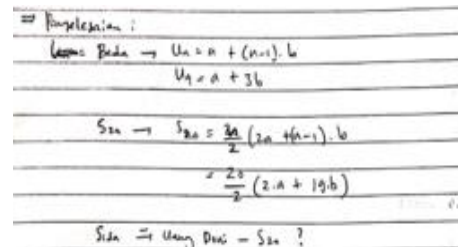

Figure 2 SSQT's handwriting in preparing the M1 Completion Plan

SSQT's handwriting in Compiling a M1 settlement plan, by assuming that taking money in the first week is (U1) or a and taking money in the 4th week is U4, then determining the difference with the arithmetic sequence formula, then writing the arithmetic series formula to determine the amount of money taken for 20 weeks.

c). Stage of Implementing the Problem Solving Plan
SSQT consistently carries out according to what was previously planned and can use previously learned concepts and is fluent in operating arithmetic sequence and series formulas to obtain solutions to problems given by researchers.

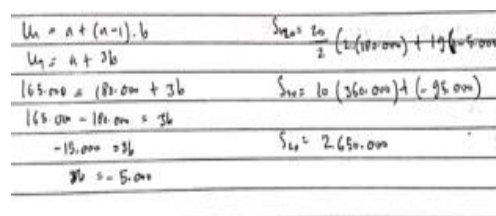SSQT handwriting in executing M1 completion plan

Figure 3 SSQT Handwriting in Implementing the M1 Completion Plan

The writing above revealed that SSQT in carrying out the M1 settlement plan consistently carried out according to what was previously planned. Start by assuming the first money draw is U_1 and taking the fourth money with U4, then finding the difference using the arithmetic sequence formula, determining the amount of money taken for 20 weeks with the arithmetic series formula, and the last step is determining Doni's remaining money by subtracting Doni's initial deposit with the amount of money that has been taken during 20 weeks.

d). Stage of Re-Checking Problem Solving

SSQT believes that the answers obtained are correct and the problems given are important so that they are

serious about finding out the truth of the answers obtained by retesting the answers..
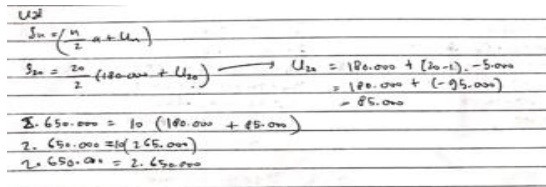
SSQT handwriting in checking Back of M1 completion

Figure 4 SSQT handwriting in checking back M1 completion

The handwriting above revealed that SSQT was tested by checking whether it was true that the amount of money taken for 20 weeks = 2,650,000. SSQT writes another formula for the arithmetic series that will be used, namely: Sn = (a + Un). Before substituting known values into the formula, SSQT determines in advance the money taken at week 20, or U20, after getting the results, all known values are entered in the formula then the answer is correct, the amount of money taken until week 20 is = $2,650,000\frac{n}{2}$

B. Data Analysis and SSQS Credibility Test

a). Understanding the Problem Stage

SSQS is still hesitant in solving problems so that they stutter when answering the questions given and lack understanding of the problem so they are not sure about the answers. This can be seen from how often SSQS ensures the correctness of the answers by asking questions. But SSQS is able to identify information in the form of things that are known and asked about the problems given by researchers.
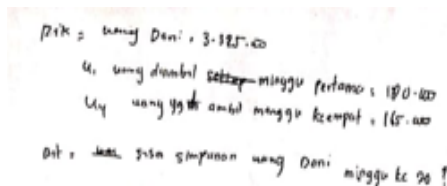
SSQS Handwriting in understanding M1

Figure 5 SSQS handwriting in understanding M1

The handwriting shows that SSQT can write down the information given in the questions, especially things that are known and asked, namely Doni's savings of Rp. 3,325,000.00. IDR 180,000 is taken the first week, 165,000 in the fourth week, the difference in withdrawing money each week is fixed and what is asked is how much money is left in Doni's savings after taking it for 20 weeks?

b). Stage of Developing a Problem Solving Plan

SSQS can apply previous knowledge about arithmetic sequences and series so that it can explain problem solving plans. As well as being able to plan problem solving by assuming first taking the first money is

U1 or a and taking the fourth money is U4, then determine the formula that will be used to solve the problem, namely using the arithmetic sequence formula then the arithmetic series formula then determines the remaining money by subtracting the deposit money at the beginning with money that has been taken for 20 weeks. However, SSQS is still unsure about the plans that have been made so that SSQS stammers in preparing a problem solving plan.

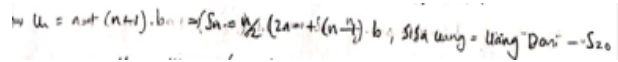SSQS handwriting in Compiling M1 completion plan

Figure 6 SSQS handwriting in Compiling M1 completion plan

The handwriting above reveals that SSQS is planning to split M1 by supposing that taking money in the first week is (U1 or a) and taking money in week 4 is U4, then determining the difference/difference with the arithmetic sequence formula, then writing the arithmetic series formula to determine the amount of money taken for 20 weeks.

c). Stage of Implementing the Problem Solving Plan

SSQS at the stage of implementing the problem solving plan shows that SSQS consistently implements it according to what was previously planned, but SSQS is still hesitant in carrying out the problem solving plan and is only able to solve using formulas and lacks understanding of solving using other methods.

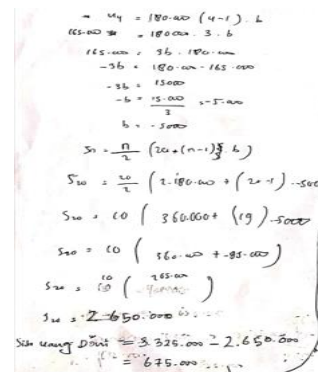SSQS Handwriting in implementing M1 completion plan

Figure 7 SSQS handwriting in implementing the M1 Completion Plan

The handwriting in the picture above reveals that SSQS in completing M1 isSSQS consistently implements what was previously planned. Starting with the example of taking the first money with U1 and taking the fourth money with U4, then find the difference using the arithmetic sequence formula, determine the amount of money taken for 20 weeks with the arithmetic series formula, and the final step determines Doni's remaining money by subtracting the initial deposit. Doni with the amount of money that has been taken for 20 weeks.

d). Stage of Re-Checking Problem Solving

SSQS mathematics problem solving profile at the research stage. Again, problem solving is doubtful in solving a problem, because there are still doubts about the answers obtained. But SSQS was able to re-examine the answers so that it was concluded that the answers that had been obtained were correct.
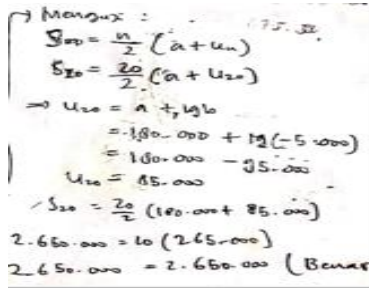
SSQS Handwriting in checking M1 Completion Return

Figure 8 SSQS handwriting in checking M1 Completion Return

The handwriting above revealed that SSQS checked back the results obtained. The SSQS steps in checking Back are tested by using another formula from the arithmetic series, namely:Sn = (a + Un). after the known values are substituted into the formula, the result is correct that the amount of money taken for 20 weeks is $2,650,000 \frac{n}{2}$

C. Data Analysis and SSQR Credibility Test
a). Understanding the Problem Stage

SSQR at the stage of understanding the problem is being able to identify information from the problem, namely things that are known and things that are asked but are unable to interpret the problem given by the researcher.
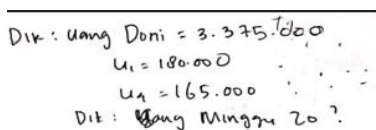
SSQR handwriting in understanding M1

Figure 9 SSQR handwriting in Understanding M1

The handwriting shows that SSQR can write down information from the M1 problem, especially things that are known and asked, namely Doni's savings of Rp. 3,325,000.00. IDR 180,000 is taken the first week, 165,000 in the fourth week, the difference in withdrawing money each week is fixed and what is asked is how much money is left in Doni's savings after taking it for 20 weeks?

b). Stage of Developing a Problem Solving Plan

SSQR at the stage of making a problem solving plan isSSQRnot sure about assuming the information that is known and asked in the problem solving plan, because they do not really understand translating the information in the problem into mathematical form and SSQR has difficulties in determining the steps of the problem solving plan, because they do not really understand the meaning of the problem. This shows that SSQR cannot apply previous knowledge and does not understand the problem properly.

c).Stage of Implementing the Problem Solving Plan

SSQR at the stage of implementing the plan is that SSQR cannot apply the knowledge possessed in solving problems because it is not appropriate to use all the information. SSQR cannot apply the concept of solving arithmetic sequences and series, and when solving problems, SSQR does not use formulas, but always does it in its own way but the results obtained are not correct,

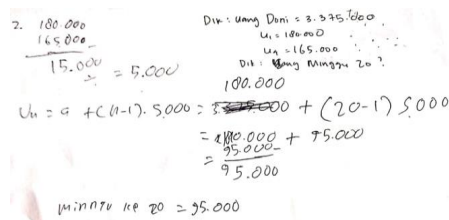SSQR handwriting in executing M1 completion plan

Table 10 SSQR handwriting in carrying out the M1 completion plan

The handwriting above reveals that the SSQR in carrying out the M1 completion plan is for example the first Take is U1 or a. the 4th withdrawal is U4, then immediately looks for the rest of Doni's savings without looking for the amount of money that has been taken first. SSQR also seems to be looking for differences without using the formula for arithmetic sequences and series, but determines it in its own way but it's not quite right, and the final step is to determine the Khalil remainder using the arithmetic sequence formula so that the answer is not correct.

d). Stage of Re-Checking Problem Solving

SSQR cannot apply previous learning experiences. So you can't re-check the answer on the grounds that your ability only ends there

IV. Conclusion

Based on the analysis and discussion, it can be concluded that:

Profile of Mathematics problem solving for Class XI SMA IT Qurrota A'yun Sigi who has high Spiritual quotient (SSQT): a) Understanding the Problem Stage:SSQT can understand problems calmly and concentrate more on the problems given so that it is easy to identify the information contained in the questions, namely things that are known and asked and are able to interpret the problems given so that SSQT is always sure of the answers. b). Stages of Developing a Problem-Solving Plan: SSQT can apply previously acquired knowledge so that it can properly explain the problem-solving plan provided by the researcher, namely by first making an example and then determining the formula to be used to find differences or differences, then determining the formula to be used to find the amount of money taken up to week 20. Then the last step is to determine how to find the remaining savings until

the 20th week by subtracting the amount of savings at the beginning from the amount of money that has been taken until the 20th week. c) Implementation Stage of the Problem Solving Plan: SSQT consistently carries out according to what was previously planned and can use the concept previously studied and fluent in operating arithmetic sequence and series formulas to obtain solutions to problems given by researchers. d) Re-examining Problem Solving Stage: SSQT believes that the answers obtained are correct and the problems given are important so that they are serious about finding out the correctness of the answers obtained by re-testing the answers.

Profile of Mathematics Problem Solving students who have Medium Spiritual quotient (SSQS): a). Stage of Understanding the Problem: SSQS hesitates in solving problems so that they stutter when answering the questions given and do not understand the problem so that they are unsure of the answers. This can be seen from the frequent SSQS ensures the correctness of the answers by asking questions. But SSQS is able to identify information in the form of things that are known and asked about the problems given by researchers. b). Stage of Developing a Problem-Solving Plan: SSQS can apply previous knowledge so that it can explain the problem-solving plan. As well as being able to plan problem solving by assuming first taking the first money is U1 or a and taking the fourth money is U4, Then determine the formula that will be used to solve the problem, namely using the arithmetic sequence formula then the arithmetic sequence formula then determines the remaining money by subtracting the initial savings from the money that has been taken for 20 weeks. However, SSQS is still unsure about the plans that have been made so that SSQS stammers in preparing a problem solving plan. c) Stage of Implementing the Problem Solving Plan: SSQS consistently carries out according to what was previously planned, but SSQS is still hesitant in carrying out the problem solving plan and is only able to solve using formulas and does not understand solving using other methods. d). Stage of Re-Checking Problem Solving: SSQS is hesitant in solving a problem,

Profile of students who have low spiritual quotient (SSQR), namely:a). Understanding the Problem Stage: SSQR can identify information from problems, namely things that are known and things that asked but are unable to interpret the problems given by researchers. b). Stages of Developing a Problem Solving Plan: SSQR is not sure in assuming the information that is known and asked in the problem solving plan, because they do not really understand translating the information in the problem into mathematical form and SSQR has difficulty determining the steps of the problem solving plan, because they do not really understand the meaning of the problem. This shows that SSQR cannot apply previous knowledge and does not understand the problem properly. c). Stage of Implementing the Problem Solving Plan: SSQR cannot apply the knowledge possessed in solving the problem because it is not appropriate to use all the information. SSQR cannot apply the concept of solving arithmetic sequences and series, and when solving problems, SSQR does not use formulas, but always does it in its own way but the results obtained are not correct, d). Stage of Re-examining Problem Solving: SSQR cannot apply previous learning experiences. So you can't re-check the answer on the grounds that its ability only ends there.

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