

# Student profile in constructing concept of exponential through the problem posing

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**Abstract.** This study has the aim to describe the thinking process of students in constructing of exponential concept through problem posing. In this study constructivism through the problem posing in question is a process to assist students in developing mathematical concepts and principles with their own abilities through the process of obtaining information and also the information processing process for later making problems by students. This research type are descriptive research with a case study form using a qualitative approach. This research was conducted on the tenth grade Vocational students in the field of Computer and Network Engineering expertise with a total of ten students. The method of data collection well done through interviews, written tests, observations, and documentation. The data validation used by researchers was triangulation using the source triangulation type. The results of the study show that the construction of the exponential concept is influenced by the thinking of students process when they concept process through posing problem.

## 1. Introduction

Mathematics as a means of critical scientific thinking is indispensable in the civilization of every science. Mathematics as a tool has been widely applied to help in solving problems faced by humans. In addition, some concepts are needed by other science fields especially the connection to the scientific field. The assignment completion does not only depend on the final solution, but how their thinking processes to understand what is known and asked in the problem then change it in a mathematical model and illustrate it until the problem solving is found [8].

Mathematics is a science that teaches accuracy and certainty in carrying out a scientific action. Mathematics teaches us the importance of a definite foundation for determining the next steps in various actions. This character is the fundamental basis of mathematics used as a basic foundation by other disciplines. The benefits of mathematics as critical means of scientific thinking that are indispensable in civilization of every science. Mathematics as a tool has been widely applied to help solve problems faced by humans, but many of the concepts that are needed by other sciences, especially in relation to scientific action. Differences in students' mathematical abilities will affect all their actions in terms of understanding problems, interpreting problems and solving problems. High students' mathematical abilities will be very different from low students' mathematical abilities.

Learning is a combination that is composed including human elements, materials, facilities, equipment, and procedures that affect each other to achieve learning objectives ". Humans are



involved in the learning system consisting of students, teachers and other personnel. In the learning process there is a series of collaborations between the teacher and students. This collaboration is a process in which a person's environment is intentionally managed to enable him to participate in certain behaviors in special conditions or produce responses to certain situations, learning is a special subset of education. Learning in the philosophy of constructivism is an active process of students in constructing concepts. In the constructivism perspective, learning is also a process of assimilating and linking the experiences or materials learned with the understanding that someone already has so that the understanding is developed.

Ananda Avriani [2] explained that Researchers try to build complex problems on this exponential concept combined with analyzing various theoretical and opinions from informants. The whole process was designed in a natural setting of any pressure. In the process, the researcher used mathematics learning to formulate the research problem. Students were required to through patterns and rhythmic. Meanwhile, the second ability was when the student read and re expressed. This is the ability that being observed by researchers to describe the work of students in exploring their own arguments based on logical reasons according to existing mathematical theorems.

Dewi Rustiani Learning by constructing of a concept through Problem Posing is one form of learning activity that focuses more on the awareness of one learning by giving students the freedom of learning focus control to the students themselves. Independent learning does not mean having to study independently as self study. Students often mis interpret the concept of independent learning as self study. As an independent person, students do not have to know everything, but they are also not expected to be genius students who do not need help from others. A student is expected to be able to :

1. Realize that the relationship between the teacher and himself actually exists, but the relationship has been replaced by teaching materials or learning media;
2. Find out the concept of independent learning;
3. Find out when he should ask for help, when he needs help or support;
4. Tell who and from whom he can or must get help or support.

This method is the same as a process of teaching self-reliance in students where an individual student takes the initiative, with or without the help of others, and the process in self directed learning is done by realizing one's own needs in learning, setting personal goals, making decisions at the source and learning strategies and assessing results. Through problem submission will teach students to learn to actualize their creative variety towards the stage of stratification of their individual competencies. The results of the idea actualization will bring students back to produce new concepts of creativity from the main concept that is exponential in the form of concept development that they can understand and other readers also understand. In the activity of raising the problem, the information provided by the teacher must be processed first so that several mathematical problems are generated.

Johan Avensius said that about concept construction problem through problem submission is a process based on mathematical experience and then constructs students interpretation of concrete situations and formulates them into meaningful mathematical problems. Construction are need to submit problems in the process of constructing students ideas is a major component in creating the connection and representation ability of the main concepts in mathematics learning. This component is a supporting factor for the creation of new ideas by students on the main concepts they develop. The most important element in the results of this study is that a student is said to be creative if the student is able to foster personal knowledge in an innovative way by connecting new concepts with existing concepts [4].

The main reason for using the problem submission in the process of building students' creative ideas and logical thinking is because the submission of problems is the main competency that must exist in the process of extracting ideas to how the ideas can be rebuilt. This opinion are complicated because the ability to submit problems does not only analogical students reasoning but also positively influences students ability to solve problems. There is a significant relationship between problem solving characteristic step and problem solving skills. More than it, there has been a parallel between the number of problems raised and the success in solving the problem. One of the characteristics of students that need to be studied and considered in learning is student cognitive style. This is because if when the student is creating the exponential main concept by not paying attention to the cognitive style of each student, then of course the process of raising the problem will look like forcing an activity on students and will get not maximum results [2].

Siti Assyifa [3] said that expected implication is to be able to provide motivation to teachers in understanding mathematics learning and further research. It also can provide understanding that for the sake of improving learning. Each student in expressing his creative ideas through problem solving must have a special way of taking action that can be expressed through various forms of perceptual and intellectual activity known as cognitive styles in problem solving.

The purpose of this study are to describe the profile of students in constructing the concept of Exponentials through problem submission. The Problem Posing taught the students to learn in actualizing the creative ideas towards the stratification stage of their individual competency. The results of the idea actualization would bring the students back to produce prototypes in the form of developing concepts that they able to understand. On one hand, the readers also understand [11].

The results of this research is to be able to provide the idea that students with high problem solving abilities will definitely have excellent problem posing abilities. This can be proven from the aspects of students' internal abilities, the quality of student responses, and the external quality of students themselves. Thus the submission of problems and problem solving are closely related, both of which have a positive influence on each other.

This research is supported by many references both the results of research in the form of a thesis or dissertation. The results are used as a reference supporting the results of this study by researchers in the form of research journal excerpts. The results of this research can later be used as a supporter of several other research results which are indeed discussions about the surrender of a mathematical concept through problem solving. This research is the result of the development of several previous years with the minimal research year taken by in 2014 [7].

## 2. Methodology

In this study, researchers used a type of descriptive research through a qualitative approach. Descriptive research is a form of research that describes a form of events based on the study of authentic evidence in the form of primary data as primary evidence and secondary data as supporting evidence. While the qualitative research approach is a form of approach used in research that is based on conditions of originality and researchers are in the position as the key to the reality of the conition [5].

This research was conducted at Al-Imam Vocational School Pakusari especially the Department of Computer and Network Engineering in 2017-2018 academic year. The participants were the tenth graders and there were ten people who had received prior teaching about the exponential concept. The research subjects were determined by considering the students communication fluency in expressing their ideas through the problem posing.

Nana Saodih Sukmadinata [9] said about the design of this research is by describing a symptom based on indicators that form the basis of the presence or absence of a phenomenon under study. This is in accordance with the literature review that researchers have done that under study are 2 variables. These variables are the ability of student constructivism and the ability to raise problems.

The instrument used in this study refers to research instruments that are always used in research with a qualitative approach in general, that is :

- Major Instrument

The major instrument referred to here is the skills and creativity of researchers in exploring the source of data to be carried out research that includes direct and structured observation, interviews, and documentation.

- Companion Instrument

The accompanying instrument used by researchers here is a set of general research tools consisting of student worksheets, student constructivist competency test sheets, student ability observation sheets, instrument validation sheets.

Data processed in this study include: (a). Interview Data, (b). Exponential Construction Process Data, (c). Data Submission of Exponential Construction Problems, (d). Data Application of Exponential Construction. This data will be explain factor as well as a descriptive factor from the results of research that has been done.

Data collection methods has carried out through interviews, written tests, observations, and documentation. For data validation the researchers used triangulation using the type of source triangulation. The results showed that the construction of the concept of exponential has influenced by students thinking processes as they process the concept through problem submission. As well as evidence that the results of this study are not only theoretical research but have been supported by valid data [10].

### 3. Results and Discussion

In the class studied using constructivism a mathematical concept, a teacher does not teach students how to solve problems but presents problems and encourages students to find solutions to problems by themselves. In solving problems, the teacher tries to encourage students to exchange ideas until agreement is reached. In this case the teacher's role is not the final giver of the students' questions, but rather directing students to construct mathematical knowledge so that a good mathematical structure is obtained. the steps taken by exponential concept construction through the submission of this problem, namely: (1) Orientation; (2) Disclosure of Ideas; (3) Challenges and Restructuring; (4) Application; and (5) Review. By looking at the five stages above which seek the active role of students in learning, it is hoped that learning in this way can have a positive influence on the ability to solve mathematical problems. There are several things that receive special attention in this regard, namely motivation, initial conception, and learning experience.

Based on this description, it can be concluded that learning activities in constructing concepts are active student activities in which students build their own knowledge, learners seek their own meaning from what they learn, students are empowered by the knowledge within themselves. They share strategies in solving problems, debating with one another, thinking critically about the best way to solve each problem. In solving problems, the teacher tries to encourage students to exchange ideas until agreement is reached. In this case the teacher's role is not the final provider of the students' questions, but rather directing students to construct mathematical knowledge so that a mathematical structure is obtained. The creativity of concept development through problem submission is a form of

ability in students to create and produce new concepts to increase the added value of the basic concepts that are already available. Creativity in the development of concepts is needed in an effort to open the main reference in obtaining a proper rule for future lives. Creativity also determines the mindset and character of a student in understanding a concept in mathematics. Creativity in developing concepts through the submission of this problem has a very important role because it can provide a variety of benefits for students themselves, one of which is that it can provide satisfaction and diversity of ideas is very large in every successful study of mathematical material. Another aspect of the concept development creativity through problem posing or problem solving is the need for divergent thinking skills in students with include originality, flexibility, quality, and quantity. These limits added by Gagne [1] creativity will arise in individuals if given a new case in accordance with the concept to be developed. Basically a creativity the development of mathematical concepts will emerge together with awareness there is a gap between knowledge core with new knowledge, then came a variety of alternative solutions [13].

Based on the analysis in the previous discussion, the tendency for information used by subject K in raising the problem is that the problem raised by subject K generally originated from verbal information. The tendency of information used by subject K in submitting can be concluded that the problems raised by the subjects generally come from verbal information. By constructing exponential concepts through the submission of these problems, it can make students more easily understand the exponential concept and later it is hoped that students will understand the concept of exponentials fully from real knowledge to abstract knowledge. Students' exponential knowledge gained will be in the form of experiences they have gained themselves from the exploration process.

Development of student creativity on a mathematical concept can be done by giving specific guidance in solving the problem through classification, brainstorming, and gift. Therefore, researchers or teachers must be able play a role in building at once develop creativity developing mathematical concepts by these students. This concept is in line with the theory put forward by Robert Friz [4] said that *“The most important developments in civilization have come through the creative process, but ironically, most people have not been taught to be creative.”* Hal senada disampaikan pula Ashfaq Ishaq: *“We humans have not yet achieved our full creative potential primarily because every child’s creativity is not properly nurtured. The critical role of imagination, discovery and creativity in a child’s education is only beginning to come to light and, even within the educational community, many still do not appreciate or realize its vital importance”*. This is what is commonly called the creativity of concept development by students whose goal is that the concept development process can have a high degree of actual relevance.

**Table 1.** Scoring Guidelines for the Construction Process by Posing Problems

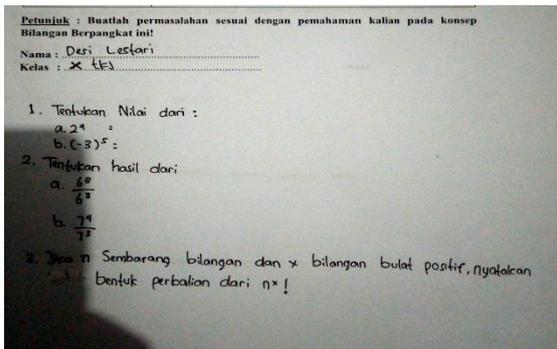
Score	Understand and interpretation concepts	Understand and interpretation concepts	Finding a Solution	Re-Checking Results
<b>0</b>	Misunderstanding and interpreting concepts	Do not make plans that are relevant to the main concept	Do not want to find a solution to the problems faced	Do not check the results of its own performance
<b>1</b>	Lack of understanding and re-interpreting concepts	Not able to make plans that are relevant to the main concepts	Not able to find solutions to problems faced	Not able to check the results of their own performance

<b>2</b>	Simply understand and re-interpretation the concept	Quite able to make plans that are relevant to the main concepts	Not able to find solutions to problems faced	Self-sufficient in examining the results performance
<b>3</b>	Able to understand and be able to reinterpretation concepts	Able to make plans that are relevant to the main concepts	Able to find solutions to problems encountered	Able to check the results of its own performance
<b>4</b>	Very capable of understanding and very capable of reinterpreting concepts	Very capable of make a plan according to procedure and relevant to the main concepts	Very Able to find solutions to every problem encountered	Very capable of checking the results of his own performance
<b>Maximum Score</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>

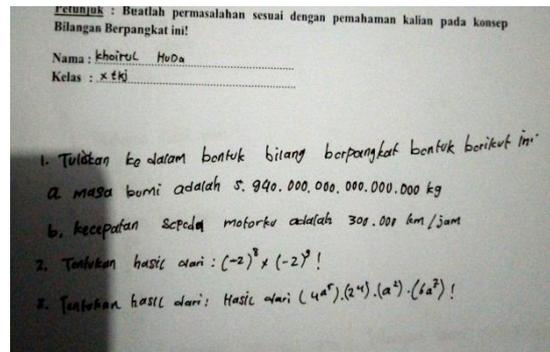
The student's thought process in examining and constructing the concept of Exponentials shows positive results in performance. Many references regarding the introduction of concepts to students by constructing. This indicates that constructivist learning requires a learning environment and constructivist stages as well. The environment around learning is not just the physical environment, but also the social and emotional environment of the students themselves and the teacher. The structure of the application of new concepts by the students they construct must be able to be flexible and dynamic according to their students' creativity. So that when they are exposed to the abstract process of exponential, they already know the exact nature of the exponential basis and can show the exponential traits precisely.

One way to find similar concept problems through various strategies in the process of problem posing is through collaborative student creativity development of the basic concepts. The main thing that needs to be done by the respondent is how the creative results of the development of the new concept are able to display the latest things that are the best. After this there is the final stage of observing the new concept of the student's creativity. Observations made with actions are experiences of the activities and products in the group against other groups. The product that the researcher intends here is a product of students' ability to propose the results of that creativity to then form an elaborative question.

Based on Figure 1 and 2 above, it appears that DL wrote the results of the construction of the concept of Exponentials through Submission of the Problem with its character that is purely a mathematical concept in accordance with what was learned previously. While the difference is shown in the work of Khoirul Huda. This student develops concepts and process problems that are very different. He narrated his entire work in the form of concept development in the form of mathematical sentences that looked so short but were quite firm in proving the development of this exponential concept.



**Figure 1.** Results of Concept Construction by Desi Lestari through Submission of Problems



**Figure 2.** Results of Concept Construction by Khoirul Huda through Submission of Problems

Researcher determines that every problem proposed is a mathematical problem. Based on these results, the researchers conducted interviews to reveal the level of understanding of students on the concept, to how the students reconstruct the concept of Exponential through the submission of problems tailored to their creativity. The follows are data from the researchers' interviews with Desi Lestari and Khoirul Huda. Even though students have low creativity with a mathematical concept, it does not mean that students do not have creative potential.

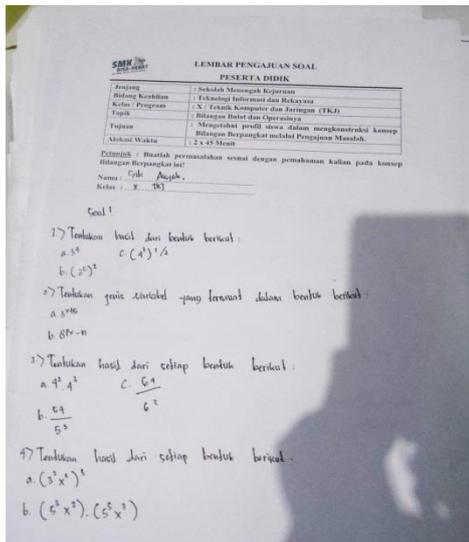
### 3.1 Presentation of Data on Interview Results of DL and KH Students

The following is a interview transcript as conducted by a Researcher (R) with a student named Khoirul Huda (KH) :

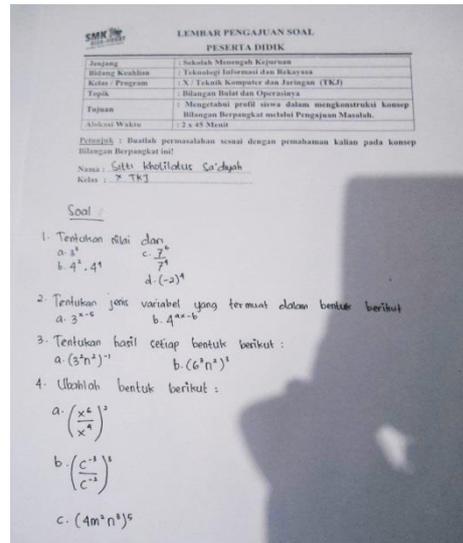
- R : *Do you understand what I mean by asking to make that problem?*  
 KH : *Yes Mr, you want to test my ability to make questions in this material.*  
 R : *It is not that. But with me telling you to make questions, then therein lies your true ability. Not only able to do the problem from me.*  
 KH : *This means that if I want to enhance my understanding of certain concepts, I must often dig deeper into one of them through the submission of problems, Mr.*  
 R : *There are many ways, one of them. So, how do you make the formulation of the problem submission by using this life problem?*  
 KH : *I just followed the order of the material and then I tried to associate it with things that are commonly found by my friends in his life, Mr!*

As for the interview transcript between Researchers (R) and students named Desi Lestari (DL) as follows :

- R : *Desi, Do you understand about the assignment that I gave to you?*  
 DL : *Yes Mr, Do you want to test my creativity in developing this exponential concept?*  
 R : *Yes, right. You are a genius. I really want to know how far your ability to develop the exponential concept that you have learned before.*  
 DL : *Can I be categorized as having been able to develop an exponential concept through a problem submission, Mr?*  
 R : *Yes I Can. You have mastered the concept of exponential and submitting this problem very well. I only suggest that there are many methods of raising problems from a mathematical concept development that you can do.*  
 DL : *Yes, Mr. Thanks for the advice. I will always develop my creativity in any material.*



**Figure 3.** Results of Concept Construction by Siti Aisyah (SA) through Submission of Problems



**Figure 4.** Results of Concept Construction by Siti Kholilatus (SK) through Submission of Problems

Based on Figure 3 and 4 above, it appears that the SA writes the results of the construction of Exponential concepts through Problem Posing using the concept development creativity which is very impressive and different from the SA and SK students who have been represented previously. While Siti Aisyah wrote her creations in developing Exponential concepts through Problem Posing using the main concepts which were then explored based on what was already in her mind. While the difference is shown in the work of Siti Kholilatus. These students develop unique concepts and Problem Posing processes. Starting from the results that look normal and then developed again towards the creation of a very good followed by results that look very good too.

The process of Problem Posing in mathematics or problems related to calculations requires a long time estimation because there is a series of processes of understanding, analyzing, developing and then doing problem posing. Researchers set a specific limitation that every problem raised is an absolute mathematical problem. Based on these results, researchers conducted interviews to reveal the level of understanding of students on this exponential concept for how students reconstruct exponential concepts through the submission of problems that are aligned to their main abilities [12]. It should be emphasized that although students have different levels of understanding and creativity with the main demands of mathematical concepts, it does not mean students do not have creative potential. The following are data from researchers interviews with Siti Aisyah and Siti Kholilatus.

### 3.2 Presentation of Data on Interview Results of SA and SK Students

The following is a interview transcript as conducted by a Researcher (R) with a student named Siti Aisyah (SA) :

R : Aisyah. Do you understand what I mean to give activities like this?

SA : Between understanding and not understanding, Mr. On one side you test my ability to understand this exponential concept, on the other side you test my other abilities in developing this concept through problem posing.

- R : *Yes right. The main purpose of the activity that I gave is to find out your level of understanding of this exponential concept and to know your ability to develop this exponential concept through problem posing.*
- SA : *This means that if I want to enhance my understanding of certain concepts, I must often dig deeper into one of them through the submission of problems, Mr.*
- R : *There are many ways, one of them. So, how do you make the formulation of the problem submission by using this life problem?*
- SA : *I will use this valuable lesson to develop various other theories according to my creativity, Mr!*

As for the interview transcript between Researchers (R) and students named Siti Kholilatus (SK) as follows :

- R : *Do you understand what I mean by asking to make that problem?*
- SK : *Yes Mr, you want to test my ability to make questions in this material.*
- R : *It is not that. But with me telling you to make questions, then therein lies your true ability. Not only able to do the problem from me.*
- SK : *This means that if I want to enhance my understanding of certain concepts, I must often dig deeper into one of them through the submission of problems, Mr.*
- R : *There are many ways, one of them. So, how do you make the formulation of the problem submission by using this life problem?*
- SK : *I will imply this best lesson for developing various concepts in life according to my personal abilities, Mr!*

Below is a table that describes the results of student work in constructing exponential concepts through problem submission.

**Table 2.** The written test result score

Quantities	Mean Score	Students who get Score $\geq 75$ (%)	Students who get Score $\leq 75$ (%)
10 Students	82,15	7 Students (70 %)	3 Students (30 %)

The data in Table 2, provide information that as many as seven students or 70% of all grade tenth students of Computer and Network Engineering received test scores  $\geq 75$ . This shows that 7 students had met the criteria in constructing the concept of this numbered number. Thus, it can be said that the process of constructing the concept of Exponentials through problem submission has been effective to meet the minimum standard score that has been determined. Differences in student ability will affect the level of understanding of different concepts. In this case understanding of the concept needs to be instilled in students to train them in solving various mathematical problems, especially in terms of problem solving. Problem solving itself is one of the abilities students must have in mathematics.

On the results of concept construction by students with somewhat grades high, it appears that the problem raised not as much as the students put forward with high marks. In terms of the quantity of problems in submit only three problems, but there is more value from the problem he made, namely the level of concept excavation and also the complexity of the concept. The three problems that he has made have fulfilled the elements of concept development through the recognition of problems and their solutions require modeling mathematics according to the expectations of researchers. The

problems raised are not just questions that can be solved easily but need a complex step to high accuracy [12].

Based on the results of data analysis obtained from the research process on the profile of students in constructing numerical numbers through problem submission there is a difference in students' creations in defining the concept of numerical numbers and an increase in student creativity in understanding the concept of this number. One of the causes is their freedom to understand the concept and express it again based on their own ability level and the factor of feeling without being bound by the restraining attitude of the learning and teaching process. Various efforts continue to be made so that students can construct concepts through the submission of problems or even solve application problems encountered in every mathematics learning with strategies to improve aspects related to learning activities. This is so students are able to have the ability of reasoning, communication, problem solving and an attitude of respect for the use of mathematics. The skill of asking problems to solve and solve problems is the goal of a mathematical concept construction.

Meanwhile, based on observations by researchers, it was found that the way of thinking of students was described through intervals, namely the greater the interval between the values obtained, the greater the improvement in the way of thinking of students obtained in constructing the concept of numerical numbers through the submission of this problem. This is caused by differences in the level of mastery of student material on this material that has been previously taught by the teacher concerned. The constructivism approach will make students more active in understanding the material provided, so that students' learning experiences will increase according to what they are doing in their learning process. Not be separated from the main concept. The learning process involves various activities and actions that students need to take in order to obtain a better quality of learning

The success of the analysis of thinking or profile in constructing this concept is also supported by the students' interest and interest to learn. In this study there are phases of interest and intensity by the students themselves at the beginning of the process where students are required to access initial knowledge by giving apperception into their thinking power. At this stage, students are expected to become interested and motivated to learn. Motivation has an impact on students to feel excited to do something or feel interested in learning to learn the material being taught. Providing initial motivation to students is very important because it can arouse students' interest and curiosity. Collaborative learning model with the type of problem submission in students is an effective way to practice students' ability to solve problems because this collaborative learning model is one of the learning models based on constructivism [11].

Based on the scores obtained by students during the research process which is  $\geq 70$ , it can be seen that all student pretest scores have not yet reached the mathematical completeness standard. This is due to the low level of students' initial knowledge of the material being taught. Based on what the researchers observed, it shows that the level of ability and understanding of students in this class can still be said to be normal. This can be seen from existing data that the number of students whose abilities fall into the category of lack is three students out of ten students. In education, constructivist ideas as mean that "all students actually construct knowledge for themselves, and not the knowledge that comes from the teacher" absorbed "by students". This means that in learning students use their own knowledge which is then constructed into learning, the knowledge obtained by students is not from a teacher.

"Students profiles on the exponential concept through problem submission can build students' confidence through strengthening their creations of concepts they understood before. This research

think is very important because with high self confidence students tend to be successful regardless of the level of ability they have. The construction of a problem is a situation where individuals want to do something but do not know the ways and actions needed to get what students expect. But students have the knowledge and ability to solve them, so students have the desire to solve these problems in ways that have been previously known

The theoretical implication of this research is that before the process of learning mathematics, a teacher should construct student understanding in advance so that students feel free in expressing their way of thinking on a concept they teach. to analyze the level of complexity associated with mathematical structures can be done by looking at the relationship of these structures associated with the ability of students to do problem solving.

Practically implication of this research that it is necessary to hold continuous education and training activities on a preliminary activity before a teacher enters the learning activities of new material by first exploring the level of student understanding and way of thinking on the material previously taught. This can have a positive impact both for students before entering new material as well as having a positive impact on the teacher itself. The concept of constructivism also sees that when students enter a learning class, the student already has an initial conception of the concept to be learned. Thus, the teacher's role in constructivism learning is as a facilitator, mediator and motivator in optimizing students' basic abilities and being able to create a better learning atmosphere.

During the process of this research, the researcher also realized that the process of knowing the students' profile in constructing numerical numbers through the submission of this problem had flaws. The drawback that researchers found was that the time needed for longer learning. This is because in teaching and learning activities are not directly given material such as the lecture method but first given motivation and enthusiasm and students are directed to be more active and participative in order to be able to process their understanding related to the mathematical concept (Adi Diwangkoro. 2018: [6]). Based on this research, it shows that the process of constructing a mathematical concept through a problem submission requires a relatively long time especially when applied to classes where students tend to be shy or feel less enthusiastic about the type of learning applied.

Gozali (2014: [9]) from his research explained that Constraints that occur during the research process include when research in Class X in the field of Computer and Network Engineering expertise at the Al-Imam Kalisat Vocational School in conjunction with student practicum assignments outside the school that causes students to come late in the afternoon so that it slightly interferes with the course of research in the time efficiency section. Based on these shortcomings and obstacles, researchers try to find solutions to overcome so that the research process runs smoothly. All students learning activities become more meaningful. Both students can individually explore the meaning as a whole to apply the subject matter that they have received previously to submit a problem.

The thing that must be remembered, is the way of thinking each student is determined by a variety factor. A problem can be the same, but possible lead to a solution which is different for each student. So the results may be very different. Factors that can affect the way it thinks between another is how a student sees as well as understanding the problem, its situation are being experienced by students and outside situations that students face, special experiences, and the most fundamental is how the level of intelligence of students own. Whereas communication on students in grade tenth Computer and Network Engineering Programs namely expressive model is a model of student communication using discussion, creative writing and carrying out activities of constructing the concept of exponential.

Submitting questions or making your own questions is one way of communicating students with expressive models (Yakobus and Dwi Wahyono. 2016: [7]).

Based on the above description, the main outline of this concept can be taken with result from Ahmad Farid (2013: [8]) said that namely learning activities by constructing exponential concepts through problem solving is an active form of student activity, where students build their own knowledge, students look for their own meaning from what they learn, students controlled by their own knowledge within them. They share strategies in solving a problem, competition with one another, think critically about the best way to solve each problem. Some solutions to overcome the existing obstacles are asking the curriculum section to postpone student work assignments to become daytime.

Statement ini above are in line with result of research from Apriani Nurita (2017:[15]) said that Besides to trying to focus more attention on the students themselves, for this process is also more emphasized on the condition of students who must be able to manage time better. Psychological conditions of students before the process of receiving material and time management greatly affect the absorption of students themselves to a concept.

#### 4. Conclusion

Based on the results of research and discussion that has been described in the previous chapter, it can be concluded that the profile of students in constructing the concept of Exponentials through different problem solving. The process of thinking of students in constructing the exponential concept which is a concept that they have understood before there are still some that experience obstacles. These obstacles include factors forget, and in a hurry. Therefore, when the problem is submitted on some of these obstacles, students easily remember it calmly because of an internal impulse towards their individual thinking power. The results of this study can encourage students to improve their problem solving abilities and can improve understanding of the concepts they have constructed.

Design of this student profile research is based on the syntax of the applicable learning based research model. The main topic generated from this research is the ability of students to construct the exponential concept through the submission of problems according to the level of ability of each student. However, there are still many students who are focused on the main concepts contained in books or online references. Therefore, it is suggested to further researchers to be able to guide their students in constructing the exponential concept with this research model so that it can enrich the variation of students idea which in turn can improve the results of the research it self.

Should be discussed by other researchers who want to implement the results of this study are based on the experience of researchers during the research for teachers is to find out how students think in constructing mathematical concepts, teachers should provide opportunities in advance to students to build their creativity during the learning process before submitting a problem.

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