

## Decision making students winning microteaching contest in design lesson plan and its implementation in mathematics learning

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### Abstract

This research aims to describe the decision-making of pre-service teacher in designing lesson plans and their implementation in learning mathematics. This type of research is qualitative research with a descriptive approach. Determination of subjects in this research using a purposive sampling technique. The subjects in this research are students of the Mathematics Education Study Program at one of the universities in East Java, Indonesia. The subjects is the winner of a microteaching competition at the university level. Learning activities are observed in the preliminary, core, and closing activities. Because this is qualitative study, the main instrument is the researcher and is assisted by observation sheets, video recordings, and interview guidelines. The conclusion is that subjects make decisions at each step of learning with the stages of building ideas, clarifying ideas, and assessing the fairness of ideas. At the idea-building stage, subjects build ideas with several/various ideas for activities to be carried out and adapted to the conditions and time of learning.

Keywords: Decision Making, Microteaching Contest, Design Lesson Plan, Implementation Mathematics Learning

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## 1. Introduction

Decision-making is a priority activity in the learning process (Bishop, 2008; Morais & de Almeida, 2012; Flood et al, 2018). The learning carried out by the teacher is very dependent on the decision-making carried out (Stahnke et al, 2016). Clough, et al. (2009) proposed a teaching decision-making framework to help novice and experienced teachers understand educational research, know important teacher decisions, and how those decisions interact to influence student learning. Decision-making is a process of choosing a preferred option or a series of actions among a set of alternatives based on a given criterion or strategy (Heravi et al, 2017; Kalbar et al, 2012; Hawkins et al, 2014). So that the decision making made by the teacher in learning is a process of choosing a series of actions among a set of alternatives in designing and implementing a lesson.

In making decisions, a person performs thinking activities that involve cognitive processes (Wang Et al 2004; Wang & Ruhe, 2007; Hawkins et al, 2014). Similarly, the decision-making made by the teacher also involves the cognitive processes of the teacher (Santaga & Yeh, 2016). If you can discover how teachers make decisions, then how teachers design and teach can be known better (Jones & Idol, 2013). Decisions can be considered a result of mental or cognitive processes that lead to a selection of action between several available alternatives (Cushman, 2013; Montibeller & Von Winterfeldt, 2015). the teacher designing mathematics learning also carries out a mental process to decide what to do during learning activities.

Studies on decision making in mathematics learning have been doing by several previous researchers (Arzarello et al, 2011; Kosko, 2016; Uygun & Dede, 2013; Griffith & Groulx, 2014; Sullivan et al, 2013; Schoenfeld, 2011). Previous study conducted Uygun & Dede (2013) related to decision making for evaluation of green supply chain management. Griffith & Groulx (2014) focuses more on the decision making made by the eighty-seven apprentice teachers who are enrolled in the master's program. They found that despite the possible and likely pressure from outside the classroom, most of them were very concerned with teaching students rather than just covering standards or following a prescribed curriculum. In contrast to what was done by Griffith & Groulx (2014) with the pre-service teacher apprentices enrolled in the master's program, Arzarello et al (2011), Schoenfeld (2011) and Sullivan et al (2013) used the subject of mathematics teachers, while Kosko (2016) used pre-service elementary mathematics teachers in decision-making in learning. This research focuses on decision making on pre-service mathematics teachers in secondary schools. This is what distinguishes this study from our current research.

Decision-making by teachers involves cognitive processes that start from generating ideas, clarifying ideas, and evaluating the reasonableness idea (Suwarno et al, 2022; Murtafiah et al, 2019; Swartz & Reagan, 1998). This cognitive process, resembles a schema (knowledge) that has just been received by students. Someone who receives new knowledge will process it, whether the knowledge can strengthen knowledge or the knowledge is contradictory (Widodo et al, 2019; Wawan et al, 2019; Widodo et al, 2020). The decision whether the new scheme can strengthen or weaken existing knowledge is very much up to the students. if the new scheme is very different from the knowledge already in the brain, then the scheme can be weakened. very different if the knowledge is in line with or in accordance with existing knowledge, then the new scheme can strengthen existing knowledge. When a teacher makes a decision, a teacher tries to generate ideas that use in making the decision. The idea used must be explained by considering their similarities and differences, combining the possessing similarities, and separating different ideas. But not all of these ideas fit the expected conditions, so the idea evaluated to make the best decisions used in decision making.

In building an idea, the first thing to do is register the possible choice of an idea. It is expected that the decision-makers will be capable provide an alternate variety, a variable idea, bring up new ideas, and these ideas can be detailed appropriately and in detail (Liedtka, 2015; Zahra et al, 2006). After precise and detailed idea details, the decision-makers should do an existing idea analysis and refer to the idea-building stage (Murtafiah et al, 2021). Decision-makers must be able to compare or contrast existing ideas (Zhang et al, 2016). Furthermore, it should be able to do the classification and come up with a definition of the idea. Then, be able to provide the reasons and assumptions of the idea. After clarifying ideas, the decision-makers assess all logical ideas that already exist. Assessment can do by determining accurate observations, determining reliable secondary sources, or based on existing facts or correct principles.

One of the decisions teachers make in math learning is decision-making about designing and implementing the learning plan. Kunandar (2011) explains that the Learning Implementation Plan is a plan that describes the procedures and organization of learning to achieve a basic competency set out in the Content Standards and described in the syllabus. Wahyuni & Ibrahim (2012) said the learning implement plan was short-term planning to estimate the action that would take place in the learning activity. Furthermore, Kunandar (2011) says that the function of lesson plans is as a reference for teachers to carry out teaching and learning activities (learning activities) to be more focused and run effectively and efficiently. In the Lesson plan, several learning activities consist of preliminary, core, and closing activities.

The introductory activity is the initial activity in a learning meeting that is shown to awaken motivation and focus the learners' attention on actively participate in the learning process. This activity consists of preparing students, doing conception and motivation, communicating the purpose of learning, and conveying the scope of learning materials. Core activities are a learning process for achieving basic competence. The core activities consist of delivering material, applying the concept from learning materials, applying learning models/approaches/strategies, using media/learning resources, classroom management, involving students in learning, implementing learning assessments. A cover activity is an activity to end the learning activity. This activity consists of summarizing the material and ended up the lesson process and subject matter and presenting the lesson plan at the next meeting

Decision-making ability is essential for teachers because of today's rapidly increasing and unpredictable progress (Tyler, 2016; Rojewski & Hill, 2017; Murtafiah et al, 2020). So that becomes a mathematics teacher who has good decision-making abilities, a potential math teacher is well equipped. To design a program of debriefing the ability to make decisions, it is necessary to reveal in-depth how the decision-making abilities of pre-service teacher students are today. This would go hand in hand with previous studies revealing the decision-making ability of college students, potential teachers, winners of a national level of creativity program to design ICT-based learning media (Murtafiah et al, 2019). Problems in the field, learning problems arise which cause decisions taken by pre-service teachers sometimes cannot be done quickly, because they have to think about solutions to these problems with limited knowledge (because they are not yet fully teachers). The results of the Murtafiah et al (2019) also recommend that students' decision-making skills be revealed with different characteristics in devising learning. Thus, the study aims to unlock the decision-making ability of would-be mathematics teachers who win microteaching competitions in designing and applying to learn.

## **2. Method**

### *2.1. Research Design*

This type of research is qualitative research with a descriptive approach that aims to describe the decision-making of pre-service teacher students in designing lesson plans and their implementation in learning mathematics. Determination of the subject in this study using the purposive sampling technique. The purpose of this study is to describe the decision making made by pre-service mathematics teacher students. so that this goal can be achieved, the considerations in taking the sample are (1) the subject is a mathematics education student who is doing a preservice teacher, (2) the smoothness of the research subject in communicating, and (3) the continuity of the learning stages carried out by the research subject. To see the fluency of communication and coherence in the stages of learning, the researchers considered students who took part in a microteaching contest conducted at a private university in Madiun, East Java. Coincidentally, the winners of the contest came from students of mathematics education, so the students who won the microteaching context at a private university in Madiun were used as research subjects. Learning activities are observed on introductory, core, and concluding activities. The learning activity to be studied to describe the decision making of pre-service teacher students in designing lesson plans and their implementation in mathematics learning. Mathematics learning referred to in this study is introductory activities: prepare the students, apperception and motivation, deliver the purpose of learning, deliver material coverage, core activities: submission of material, application the concept of learning materials, application of learning models/approaches/strategies, use of media/learning resources, class management, involving students in learning, implementation of learning assessment and closing activity: summarize the material, reflecting the process and subject matter.

In decision making there are 3 stages used in this research, namely (1) the building/generating ideas stage, (2) clarifying ideas stage, and (3) the stage of assessing the reasonableness. At the stage of building/generating ideas, the first thing to do is to list/classify the possible choices of an idea, generate new ideas and these ideas can be detailed precisely and in detail. At the stage of clarifying ideas, decision makers must be able to analyze existing ideas and refer to the stage of building ideas, comparing or contrasting existing ideas, providing reasons or clarifications and expressing the assumptions of the idea. At the stage of assessing the reasonableness of the idea, the assessment is carried out by determining accurate observations, determining reliable secondary sources or based on existing facts or logical and correct principles. These three stages were observed during the learning process carried out by pre-service teacher students. Where the learning process according to the rules is carried out in three activities, namely the introduction activities, core activities, and closing activities.

### *2.2. Data Collection*

The primary instrument in this study is its researcher, since researchers themselves plan, carry out, collect data in the study through the video and audio recordings of learning, observation, or interview with subject and report on research (Creswell, 2012). Supporting instruments in this study were interview guides, recording devices, assistive software for video and data transcripts, and observation sheets. Data retrieval through interviews does use a semi-structured interview guide. Interviews conducting to clarify and dig up problems or clarify learning activities done by subjects during the learning process, especially those involving cognitive components.

### 2.3. Analyzing of Data

The data in this study consists of 3 (three) stages. The first stage of the recording is the learning activity video by subjects. Then in the second stage, video fragment of learning activities is made based on video recordings of learning activities in their entirety. The third stage is the data from the video transcript of the study by subjects and interviews. The main data in the study came from video footage of learning practices carried out by the subject. Video clips of learning practices are used, due to the covid-19 pandemic, learning cannot be done face-to-face but must be done online learning. In order to obtain valid conclusions, researchers conducted interviews so that the subject's flow of thinking in making decisions can be known. Based on this, the research data collection technique uses the think a loud method. This method is a method obtained through the results of pronouncing everything that is thought by the research subject related to the test or problem that is done during the work.

Video fragments that have been obtained by researchers, then observed and then made a transcript. Then the data is reduced, which refers to the process of selection, simplification, translation, interpretation, and crude data transformation. Where there is invalid data, it is altered and can be used as leverage and other results. The data, in turn, is presented so that the result of the reduction of the data is composed, arranged in the relationship pattern so that it is easy to find, and has a sense of meaning. So, it can be concluded the description of student candidates' decision making in designing the mathematics of Learning Implementation Plan and implementation of it to learning.

## 3. Result and Discussion

In the learning activity, the subject decides on each good learning step in the introduction, core, and conclusion activities. This research is intended so that students can make decisions in learning practices that are carried out in accordance with the stages of learning stages, namely (1) introduction activities, (2) core activities, and (3) closing activities. As has been written in the previous section, after obtaining video fragments from the subject, they were observed and then made a transcript. Then the data is analyzed which refers to the process of selection, simplification, translation, interpretation, and crude data transformation. Here's a research subject's data exposure while performing a miracle.

### 3.1. Introduction activities

In the introduction activities, the subject performs four included activities: opening, preparing students, and doing conception and conveying the purposes of the learning done. although in general the subject is accustomed to writing in the lesson plan, but the subject is accustomed to adding activities that do not have a lesson plan, but these activities are considered necessary in the introduction activities, these activities are like giving an apperception of the learning to be learned at the meeting. Each of these activities will reveal a process of decision making that involves building ideas, clarifying ideas, and assessing them realistically.

In the opening activity, the subject builds ideas with several ideas they had, namely greetings, asking for attendance, and inviting students to pray. At the stage of clarifying ideas, the subject explains each step he does. The subject gives greetings because the subject views that greeting is important to open learning. The subject asked for attendance because the subject wanted to start learning by knowing the condition of the students. While inviting students to pray is an activity that can be done to start learning. At the stage of assessing the reasonableness of the idea, the subject

chooses one activity at the time of opening the lesson, namely greeting. This was done because greetings gave the meaning of prayer for safety for students, so it was chosen by the subject during learning activities. Salam as a greeting serves to build intimacy in the community and involvement in learning (Shields-Lysiak et al, 2020). This is by the following interview transcripts:

- Researcher : What are some things you do during the opening session?  
Subject : Look Sir, open a class, prepare a student, do a conception and communicate the purpose of the learning being done  
Researcher : In your mind what activity will be done when you open up the study?  
Subject : Greeting, asking for attendance and inviting students to pray  
Researcher : Does it really have to do that to do the opening?  
Subject : Yes, Sir, because salutations are essential to unlocking learning. And should know the student's condition at the moment of learning  
Researcher : What, pray over it?  
Subject : Because every activity I do has to pray in order to achieve the purpose of my study  
Researcher : Of the following ideas, do some activities while opening your study?  
Subject : Greeting Sir  
Researcher : What the reason?  
Subject : Greetings give meaning to prayers for salvation to students Sir

On a student's preparatory activity, the subject builds an idea that covers: asking the student's preparedness, seeing the student's state of readiness, and asking for attendance. In the stage of clarifying ideas, the subject explains what material is being taught, because the delivery of the material is material for students' readiness to learn. Furthermore, the subjects ask students' reading to begin learning, this is important as the initial effort to perform good learning. Asking is what needs to be done in mentoring (Kearney & Garfield, 2019). At the level of assessing natural ideas, the subject chooses one activity at the time of opening the study: communicating the taught materials while preparing the student's condition for the beginning of the study. This is done because good learning begins there must be a readiness of teachers and students in starting the beginning of learning. It matches the transcript of the following interview:

- Subjects : Would you please check the student's preparedness, look at the student's state of readiness and inquire for the presence of the Sir  
Researcher : Does it have to do that to do preparing students?  
Subjects : Yes Sir, I asked the students if I'm ready to study?  
Researcher : What about student presence?  
Subjects : To check how many students were present at the time, Sir  
Researcher : Of the following ideas, do some activities while opening your study?  
Subjects : Present the taught materials while preparing the students' condition for the beginning of learning  
Researcher : What was the reason?  
Subjects : Well Sir, the beginning of good learning must be there is a readiness of

teachers and students in starting the beginning of the learning, Sir

In the practice of conveying the concept of building ideas with some of the ideas, it has, namely asking for material related to the material being taught and asking back the previous material. Doing conception at the beginning of learning activities (Miyake & Norman, 1979). At the point of clarifying ideas, enlightenment provides material for recalling material related to the material being taught. The material explains the previous material to make it easier for students to remember the previous material to explain the material being taught. At the level of assessing the idea of nature, converts choose an activity at the time of opening the lesson that reminds the material that has been taught at the previous meeting. It is used to analyze students' understanding before conducting learning so that they can prepare and simplify the material being taught. It matches the following interview transcript:

Researcher : In your mind what activity will take place at conception?

Subjects : Inquiring of material relating to the material being taught and inquiring again of the previous matter, Sir

Researcher : Does it have to do that to perform conception?

Subjects : Not really, Sir, I think the student should know the material that pertains to and how it relates to the material that was previously taught

Researcher : What's the reason?

Subjects : To make it easier for students to remember the material previously to explain the material that is being taught

Researcher : Of the following ideas, do you exercise during conception?

Subjects : Reminds the material that was taught at the previous meeting

Researcher : why?

Subjects : Yes to analyze a student's understanding before administering learning so that it can prepare and facilitate the material being taught. , Sir

Henceforth, learners convey the purpose of learning taught. In this activity, trigonometry built up the idea of presenting material purposes regarding the identity of trigonometry. Specifications do not convey the specific purpose of study but merely repeat matter in parallel trigonometric comparisons of the elbow triangle. The purpose of learning must be presented specifically in carrying out learning (Hartel & Foegeding, 2004). At the level of clarifying ideas, communicating the material purpose to prepare students, and focusing on the material so that what is the purpose of learning is both within the cognitive, attitude, and psychomotor spheres. In the process of assessing natural ideas, the principal determines the activity as an important step and a turning point in carrying out learning activities so that what is the goal is accomplished and the learning is well accomplished. This matches the transcript of the following interview:

Researcher : In your mind what activity will be done at the time of conveying the purpose of the learning being taught?

- Subjects : Presenting material purpose on the identity of trig, Sir
- Researcher : Does it really have to do that in conveying the purpose of the learning being taught?
- Subjects : yes, sir
- Researcher : What the reason?
- Subjects : To prepare students and focus on the material so that what is the purpose of learning is both cognitive, attitude and psychomotor Sir
- Researcher : Of the following ideas, do you exercise during conception?
- Subjects : Conveys the purpose of learning
- Researcher : Why?
- Subjects : As an important step and a turning point in carrying out learning activities

### 3.2. Core Activities

On core activities, subjects perform six covering activities: conveying the scope of learning materials, applying learning materials, applying learning approaches/strategies, using the media and learning resources, performing the management of the learning class and evaluating and judging learning. Each of these activities would unravel a process of decision making involving building ideas, clarifying ideas and assessing naturalness.

At the core activity, concepts build on the idea of learning activities such as conveying the scope of learning materials, the first is a reverse identity, the second a comparative identity, and the third is Pythagoras identity. At the level of clarifying the idea, clarifying the individual coverage of the material as taught. Topics consider explaining the coverage of each material to be done to make students understand in detail about the coverage of the material. Parallels provide examples in any of the material covered that is taught. In learning one of the methods is used by setting an example for each learning material (Johnson, 1991). At the level of assessing the naturality-the idea, the explanation explains in detail and sets an example. These activities enabling students to understand any material coverage to result in a material understanding and can implement in resolving the problem in the material. This matches the transcript of the following interview:

- Researcher : In your mind, what activities will be carried out in conveying the scope of the learning material?
- Subjects : Delivering learning material, namely the opposite identity, the second is the comparative identity, and the third is the Pythagorean identity, sir.
- Researcher : Do you really have to do that to do apperception?
- Subjects : yes sir
- Researcher : What the reason?
- Subjects : Each material must be implemented to make students understand in detail about the scope of the material sir



Researcher : Other than that?

Subjects : Give examples in each scope of the material being taught

Researcher : Of all the ideas you have, did you carry out activities when delivering the scope of learning materials?

Subjects : Explain in detail and give examples

Researcher : What is the basis?

Subjects : By making students understand every scope of material so that it results in understanding the material and being able to implement it in solving problems on the material, Sir

In implementing the concept of learning materials, the subject builds on ideas by giving examples of materials related to real-life such as Pythagoras' identity material. At the point of clarifying ideas, the subject teaches the concepts of learning materials well, the subject realizes that the application of learning materials facilitates students with some materials related to real life. Implementation of concept materials must be made for the use of matter in everyday life. In learning should be applied in everyday life (Indrasari et al, 2020). At the level of moderate assessment of ideas, the subject generates the application of the concept of learning as the material for students to understand the learning materials being taught. This matches the transcript of the following interview:

Researcher : In your mind, what activity will do when implementing the concept of learning materials?

Subjects : Give an example of real-life material, Sir

Researcher : on what material?

Subjects : Phytagoras identity

Researcher : Does it really have to do that in conveying the purpose of the learning being taught?

Subjects : No, sir

Researcher : OK, so what's the reason?

Subjects : Implementation of concept learning materials makes it easier for students with some materials associated with real life, Sir

Researcher : Of all the ideas you have, did you carry out activities when implementing the concept of learning materials?

Subjects : Generalizing the implementation of the learning concept

Researcher : why?

Subjects : As material for students to understand the learning material taught, Sir

Furthermore, in the activity of implementing a learning strategy/approach, the subject builds ideas with several ideas such as explaining new material, giving examples of questions, giving some questions, giving practice questions. At the stage of clarifying ideas, the subject looked at explaining

by giving examples as a strategy to make it easier for students to understand the learning material. The subject views the provision of several questions as an approach to assessing the extent of student understanding. The subject also provides practice questions as a strategy to provide more understanding by answering several questions so that they can be implemented on actual questions. At the stage of assessing the reasonableness of the idea, the subject chooses to ask questions to students in each explanation of the material provided so that the subject is selected during the learning activity. This is by the following interview transcript:

Researcher : What activity do you think will take when applying learning strategies/approaches?

Subjects : Explaining the new material provides an example of the problem, giving questions and giving the exercise question, Sir

Researcher : Is it really necessary to do that during the application of the learning strategy/approach?

Subjects : Not really Sir,

Researcher : Okay, so what's the reason?

Subjects : Setting an example as one of the strategies for making it easier for students to understand the learning materials, Sir

Researcher : How about asking a question?

Subjects : For a question is a false approach to judging the extent of the understanding students have, Sir

Researcher : Of these ideas, you engage in activities during application of the learning strategy/approach?

Subjects : Asking students questions in each material explanation given

Researcher : why?

Subjects : To find out the understanding that, sir

In activities using media and learning resources, learners build ideas with multiple ideas just like using learning media, using learning resources. At the level of clarifying ideas, ideas select ideas using the learning medium as a bridge of interaction between students and students in the learning process. Parallels the use of learning media are easier to digest by students on learning done. In the process of assessing natural ideas, practitioners assess the use of the learning media as a component of teaching methods that are an effort to enable learning processes that combine facts and ideas to explain material in mathematics. This matches the transcript of the following interview:

Researcher : In your mind what activity will be done at the time of the use of media and learning resources?

Subjects : Yes, using learning media, using learning resources, sir

Researcher : Is it really necessary to do that when using media and learning resources?

Subjects : Not really, Sir.

Researcher : Oke, so what the reason?

Subjects : The use of learning media is easier for students to understand in the learning carried out, sir

Researcher : Of all the ideas you have, do you carry out activities when using media and learning resources?

Subjects : Using learning media

Researcher : Why?

Subjects : To combine facts and ideas to explain the material in mathematics, sir

On learning class management activities, workshops build ideas with activities involving students in the management of the learning class. At the level of clarifying ideas, Suggestions select ideas involving students in learning to turn on an interactive class atmosphere and do not seem passive. Student intersections in the training interactions to make students also active and interactive (Wang et al, 2009). Students are encouraged to be courteous with material, sometimes asking questions to invite students to be active in learning activities such as at 600. The trick is to look between the left side and the right side, which one would we be?. Then, on the exercise of moderate assessment, prediction by the involvement of all students in each successive measure will result in students' quick understanding and understanding of the material being taught. Contending with students' involvement in learning will result in a comfortable and effective class atmosphere in learning. This matches the transcript of the following interview:

Researcher : In your mind what activity will take place during the learning class management?

Subjects : Involve students in the management of the learning class, Sir

Researcher : Do you really have to do that during learning class management?

Subjects : Yes Sir,

Researcher : What the reason?

Subjects : To turn on the atmosphere of an interactive class and not seem passive, Sir

Researcher : Of these ideas, you do activity during the learning class management?

Subjects : Participation of all students in each learning step

Researcher : What the reason?

Subjects : To create a comfortable and effective classroom atmosphere in the study, Sir

At the learning assessments and assessments activity, Suggestions build ideas with some of them provide a problem exercise, inviting students to work on the problem within each material, appointing students to solve the problem. At the level of clarifying ideas, choosing to give the exercise problem to check, monitoring the understanding students have of the materials being taught. Gehenna created 5 exercises to see how far the trainee had satisfied in completing the question. At the level of moderate assessments, generalizations generalize that if all students can answer the exercises given by the endowed then the done learning has been consistent with either the purpose of the study or the opposite. This matches the transcript of the following interview:

- Researcher : In your mind what activity will be done during the learning evaluation and assessment?
- Subjects : Provides an exercise in problems, asks the student to do the problem in each material, appointing the student to solve the problem, Sir
- Researcher : Does it really have to do that during learning assessments and assessments?
- Subjects : Not really Sir,
- Researcher : Oke, so what the reason?
- Subjects : To check, monitor the understanding the students have of the material being taught, Sir
- Researcher : Of these ideas, do you engage in activities during learning assessments and assessments?
- Subjects : Generalization Sir
- Researcher : Why?
- Subjects : Look Sir, if all students can answer the assigned training, then the learning is done according to the purpose of the study or otherwise sir

### 3.3. Closing Activities

In the closing activities, the subjects carried out two activities which included: providing a reflection on the material to be continued at the next meeting and closing the learning activities. Each of these activities will reveal the decision-making process which includes building ideas, clarifying ideas, and assessing the reasonableness of ideas.

At the end of the activity, the subject builds up ideas by continuing the exercises at home and greeting. At the clarifying stage of the idea, the subject salutes because the subject sees that salutations are important for closing the lesson. The subject allowed continuing the wonderful training at home. At the level of assessing natural ideas, the subject chooses one of the activities at the end of the lesson, which is greeting. This is done because the greeting gives the meaning of safety for students, so it is chosen as the final activity in learning (Bickmore & Picard, 2005).

### 4. Conclusion

Based on the results and the above discussion, it can be concluded that in the learning activity accomplished, the subject must make a decision for each of the learning steps both in the introduction, core, and conclusion activities. such as the subject must carry out apperception activities to the subject matter carried out at the time of learning. even though it was not written by the subject, but because the subject felt it needed to be conveyed, the subject decided to convey it to the students. Beside that in the introduction activities, the subjects do opening activities, prepare students and do conception and convey the purposes of the learning done. On core activities, subjects extend the scope of learning materials, implement learning materials, implement learning approaches/strategies, use the media and learning resources, perform class management and do the learning assessments. In the class, the closing activity reflects on the material that will continue at the next meeting and conclude the learning activity.

In general, subjects make decisions at each step of learning with the stages of building ideas, clarifying ideas, and assessing the reasonableness of ideas. At the idea-building stage, subjects build ideas with several/various ideas for activities to be carried out and adapted to the conditions and time of learning. At the stage of clarifying ideas, subjects provide explanations or reasons for each idea that will be carried out at each learning step. Subjects always consider and have reasons in deciding the steps to be taken at each step of learning. Meanwhile, at the stage of assessing the reasonableness of the idea, the subjects decide by choosing the right activity idea to carry out the learning and have a strong reason for choosing each decision.

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### References

- Arzarello, F., Ascari, M., Thomas, M., & Yoon, C. (2011). Teaching practice: a comparison of two teachers' decision making in the mathematics classroom. In *Proceedings of the 35th conference of the international group for the psychology of mathematics education* (Vol. 2, pp. 65-72).
- Bickmore, T. W., & Picard, R. W. (2005). Establishing and maintaining long-term human-computer relationships. *ACM Transactions on Computer-Human Interaction (TOCHI)*, 12(2), 293-327. <https://doi.org/10.1145/1067860.1067867>
- Bishop A.J. (2008) Decision-Making, the Intervening Variable. In: Clarkson P., Presmeg N. (eds) Critical Issues in Mathematics Education. Springer, Boston, MA. [https://doi.org/10.1007/978-0-387-09673-5\\_3](https://doi.org/10.1007/978-0-387-09673-5_3).
- Clough, M. P., Berg, C. A., & Olson, J. K. (2009). Promoting effective science teacher education and science teaching: A framework for teacher decision-making. *International Journal of Science and Mathematics Education*, 7(4), 821-847. <https://doi.org/10.1007/s10763-008-9146-7>
- Creswell, J W. 2012. Research Design Pendekatan Kualitatif, Kuantitatif, dan Mixed. Yogyakarta: Pustaka Pelajar.
- Cushman, F. (2013). Action, outcome, and value: A dual-system framework for morality. *Personality and social psychology review*, 17(3), 273-292. <https://doi.org/10.1177/1088868313495594>
- Flood, S., Cradock-Henry, N. A., Blackett, P., & Edwards, P. (2018). Adaptive and interactive climate futures: systematic review of 'serious games' for engagement and decision-making. *Environmental Research Letters*, 13(6), 063005. <https://doi.org/10.1088/1748-9326/aac1c6>
- Griffith, R., & Groulx, J. (2014). Profile for Teacher Decision Making: A Closer Look at Beliefs and Practice. *Journal of Research in Education*, 24(2), 103-115. Retrived from <https://eric.ed.gov/?id=EJ1098171>
- Hartel, R. W., & Foegeding, E. A. (2004). Learning: Objectives, competencies, or outcomes?. *Journal of Food Science Education*, 3(4), 69-70. Retrived from <https://lccc.wy.edu/Documents/Academics/Online/learningObjectivesCompetenciesOutcomes.pdf>
- Hawkins, G. E., Marley, A. A. J., Heathcote, A., Flynn, T. N., Louviere, J. J., & Brown, S. D. (2014). Integrating cognitive process and descriptive models of attitudes and preferences. *Cognitive science*, 38(4), 701-735. <https://doi.org/10.1111/cogs.12094>

- Murtafiah, W., Lukitasari, M., Lestari, N. S. D., Zayyadi, M., Widodo, S. A. (2022). Decision Making Students Winning Microteaching Contest in Designing Lesson Plan and Implementation in Mathematics Learning. *Cypriot Journal of Educational Science*. 17(6), 2045-2060. <https://doi.org/10.18844/cjes.v17i6.7497>
- Heravi, G., Fathi, M., & Faeghi, S. (2017). Multi-criteria group decision-making method for optimal selection of sustainable industrial building options focused on petrochemical projects. *Journal of Cleaner Production*, 142, 2999-3013. <https://doi.org/10.1016/j.jclepro.2016.10.168>
- Indrasari, N., Parno, P., Hidayat, A., Purwaningsih, E., & Wahyuni, H. (2020, April). Designing and implementing STEM-based teaching materials of static fluid to increase scientific literacy skills. In *AIP Conference Proceedings* (Vol. 2215, No. 1, p. 050006). AIP Publishing LLC. <https://doi.org/10.1063/5.0000532>
- Jones, B. F., & Idol, L. (2013). *Dimensions of thinking and cognitive instruction*. Routledge.
- Johnson, D. W. (1991). Cooperative Learning: Increasing College Faculty Instructional Productivity. ASHE-ERIC Higher Education Report No. 4, 1991. ASHE-ERIC Higher Education Reports, George Washington University, One Dupont Circle, Suite 630, Washington, DC 20036-1183.
- Kalbar, P. P., Karmakar, S., & Asolekar, S. R. (2012). Selection of an appropriate wastewater treatment technology: A scenario-based multiple-attribute decision-making approach. *Journal of environmental management*, 113, 158-169. <https://doi.org/10.1016/j.jenvman.2012.08.025>
- Kosko, K. W. (2016). Preservice elementary mathematics teachers decision making: The questions they ask and the tasks they select. In *Proceedings of the 38th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 1341-1344).
- Kearney, W. S., & Garfield, T. (2019). Student readiness to learn and teacher effectiveness: Two key factors in middle grades mathematics achievement. *RMLE Online*, 42(5), 1-12. <https://doi.org/10.1080/19404476.2019.1607138>
- Kunandar. 2011. *Teacher Profesional (Implementasi Kurikulum Tingkat Satuan Pendidikan dan Sukses Dalam Sertifikasi Teacher)*. Jakarta: Raja Grafindo Persada.
- Liedtka, J. (2015). Perspective: Linking design thinking with innovation outcomes through cognitive bias reduction. *Journal of product innovation management*, 32(6), 925-938. <https://doi.org/10.1111/jpim.12163>
- Miyake, N., & Norman, D. A. (1979). To ask a question, one must know enough to know what is not known. *Journal of verbal learning and verbal behavior*, 18(3), 357-364. [https://doi.org/10.1016/S0022-5371\(79\)90200-7](https://doi.org/10.1016/S0022-5371(79)90200-7)
- Montibeller, G., & Von Winterfeldt, D. (2015). Cognitive and motivational biases in decision and risk analysis. *Risk analysis*, 35(7), 1230-1251. <https://doi.org/10.1111/risa.12360>
- Morais, D. C., & de Almeida, A. T. (2012). Group decision making on water resources based on analysis of individual rankings. *Omega*, 40(1), 42-52. <https://doi.org/10.1016/j.omega.2011.03.005>
- Murtafiah, W., Sa'dijah, C., Tjang, D. C., & Susiswo, S. (2019). Decision making of the winner of the national student creativity program in designing ICT-based learning media. *TEM Journal*, 8(3), 1039. Retrived from <https://www.ceeol.com/search/article-detail?id=791131>
- Murtafiah, W., Suwarno, S., & Lestari, N. D. S. (2020, October). Exploring the types of a material presentation by teachers in mathematics learning during the COVID-19 pandemic. In *Journal of Physics: Conference Series* (Vol. 1663, No. 1, p. 012043). IOP Publishing. <https://doi.org/10.1088/1742-6596/1663/1/012043>
- Murtafiah, W., Lukitasari, M., & Lestari, N. D. S. (2021). Exploring the Decision-Making Process of Pre-Service Teachers in Solving Mathematics Literacy Problems. *Jurnal Pendidikan Matematika*, 15(2), 145-160.
- Rojewski, J. W., & Hill, R. B. (2017). A framework for 21st-century career-technical and workforce education curricula. *Peabody Journal of Education*, 92(2), 180-191. <https://doi.org/10.1080/0161956X.2017.1302211>

- Murtafiah, W., Lukitasari, M., Lestari, N. S. D., Zayyadi, M., Widodo, S. A. (2022). Decision Making Students Winning Microteaching Contest in Designing Lesson Plan and Implementation in Mathematics Learning. *Cypriot Journal of Educational Science*. 17(6), 2045-2060. <https://doi.org/10.18844/cjes.v17i6.7497>
- Santagata, R., & Yeh, C. (2016). The role of perception, interpretation, and decision making in the development of beginning teachers' competence. *ZDM*, 48(1), 153-165.
- Schoenfeld, A. H. (2011). Toward professional development for teachers grounded in a theory of decision making. *Zdm*, 43(4), 457-469. <https://doi.org/10.1007/s11858-011-0307-8>
- Shields-Lysiak, L., Boyd, M. P., Iorio Jr, J., & Vasquez, C. R. (2020). Classroom greetings: More than a simple hello. *Iranian Journal of Language Teaching Research*, 8(3 (Special Issue)), 41-56. Retrived from <https://files.eric.ed.gov/fulltext/EJ1271032.pdf>
- Stahnke, R., Schueler, S., & Roesken-Winter, B. (2016). Teachers' perception, interpretation, and decision-making: a systematic review of empirical mathematics education research. *Zdm*, 48(1), 1-27.
- Sullivan, P., Clarke, D., Clarke, D., & Roche, A. (2013). Teachers' Decisions about Mathematics Tasks When Planning. *Mathematics Education Research Group of Australasia*. Retrived from <https://eric.ed.gov/?id=ED573025>
- Suwarno, S., Nusantara, T., Susiswo, S., & Irawati, S. (2022). The decision making strategy of prospective mathematics teachers in improving LOTS to be HOTS problem. *International Journal of Nonlinear Analysis and Applications*, 13(1), 1613-1627. <https://dx.doi.org/10.22075/ijnaa.2022.5776>
- Swartz, R. J., Fischer, S. D., & Parks, S. (1998). *Infusing the Teaching of Critical and Creative Thinking into Secondary Science: A Lesson Design Handbook*. Critical Thinking Books and Software, PO Box 448, Pacific Grove, CA 93950-0448. Retrived from <https://eric.ed.gov/?id=ED438167>
- Tyler, D. E. (2016). Communication Behaviors of Principals at High Performing Title I Elementary Schools in Virginia: School Leaders, Communication, and Transformative Efforts. *Creighton Journal of Interdisciplinary Leadership*, 2(2), 2-16. Retrived from <https://eric.ed.gov/?id=EJ1152186>
- Uygun, Ö., & Dede, A. (2016). Performance evaluation of green supply chain management using integrated fuzzy multi-criteria decision making techniques. *Computers & Industrial Engineering*, 102, 502-511. <https://doi.org/10.1016/j.cie.2016.02.020>
- Wahyuni, S dan Ibrahim, A.S. 2012. *Perencanaan Pembelajaran Bahasa Berkarakter*. Malang: Refika Aditama.
- Wang, Y., & Ruhe, G. (2007). The cognitive process of decision making. *International Journal of Cognitive Informatics and Natural Intelligence (IJCINI)*, 1(2), 73-85. <https://doi.org/10.4018/jcini.2007040105>.
- Wang, Y., Liu, D., & Ruhe, G. (2004, August). Formal description of the cognitive process of decision making. In *Proceedings of the Third IEEE International Conference on Cognitive Informatics, 2004*. (pp. 124-130). IEEE. DOI: [10.1109/COGINF.2004.1327467](https://doi.org/10.1109/COGINF.2004.1327467)
- Wang, M., Shen, R., Novak, D., & Pan, X. (2009). The impact of mobile learning on students' learning behaviours and performance: Report from a large blended classroom. *British Journal of Educational Technology*, 40(4), 673-695.
- Wawan, Ningsih, E. F., Widodo, S. A., Leonard, Sary, R. M., & Retnowati, E. (2019). The cognitive load of learners in the learning process of the rotating object volume. *Journal of Physics: Conference Series*, 1315(1). <https://iopscience.iop.org/article/10.1088/1742-6596/1315/1/012046>
- Widodo, S. A., Turmudi, & Dahlan, J. A. (2019). An error students in mathematical problems solves based on cognitive development. *International Journal of Scientific and Technology Research*, 8(7), 433-439.
- Widodo, S. A., Irfan, M., Trisniawati, T., Hidayat, W., Perbowo, K. S., Noto, M. S., & Prahmana, R. C. I. (2020). Process of algebra problem-solving in formal student. *Journal of Physics: Conference Series*, 1657(1). <https://iopscience.iop.org/article/10.1088/1742-6596/1657/1/012092>

- Murtafiah, W., Lukitasari, M., Lestari, N. S. D., Zayyadi, M., Widodo, S. A. (2022). Decision Making Students Winning Microteaching Contest in Designing Lesson Plan and Implementation in Mathematics Learning. *Cypriot Journal of Educational Science*. 17(6), 2045-2060. <https://doi.org/10.18844/cjes.v17i6.7497>
- Zahra, S. A., Sapienza, H. J., & Davidsson, P. (2006). Entrepreneurship and dynamic capabilities: A review, model and research agenda. *Journal of Management studies*, 43(4), 917-955. <https://doi.org/10.1111/j.1467-6486.2006.00616.x>
- Zhang, X., Anderson, R. C., Morris, J., Miller, B., Nguyen-Jahiel, K. T., Lin, T. J., ... & Hsu, J. Y. L. (2016). Improving children's competence as decision makers: contrasting effects of collaborative interaction and direct instruction. *American Educational Research Journal*, 53(1), 194-223. <https://doi.org/10.3102/0002831215618663>