

# Soft Skill Attributes

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# Soft Skill Attributes of High School Teachers in Teaching Mathematics

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## Abstract

The assessment of students' learning outcomes in elementary and junior high schools involved the aspects of attitudes, knowledge, and skills. Attitudes and skills were the subsets of soft skills while knowledge referred to hard skills. Soft skills and hard skills were two domains that should be well-developed in teaching and learning process. This study aimed to identify the attributes of soft skills that teachers developed in mathematics course, in particular to high school students. It was descriptive qualitative research which subject was one mathematics teacher from SMAN 3 Jombang and from SMAN 1 Pare, Kediri. We observed their teaching-learning activities before finally distributing questionnaires to the teachers and students. Then, we organized an interview with the teachers. Credibility of the collected data was confirmed through triangulation method. Afterward, in-depth analysis was conducted. The result showed that subject 1 developed some soft skills attributes including verbal math communication, time management, creativity, critical thinking, and teamwork. Subject 2 developed verbal and non-verbal math communication, time management, stress management, creativity, critical thinking, teamwork, and problem-solving. With the emergence of the attributes of the teacher's soft skills in learning, the teacher has applied these soft skills and can then be arranged as an instrument for assessing soft skills.

## Keywords

Soft Skills Attributes, Mathematics Teacher, Mathematics Teaching.

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## Introduction

<sup>2</sup> Based on the Regulation of the Ministry of Education and Culture No. 22/ 2016 about the process standard of elementary and junior high schools, the process of teaching in every unit of education should be interactive, inspiring, interesting, and challenging which motivated students to have active participation and space for their initiative, creativity, and autonomy in accordance to their talent, interest, and physical as well as psychological development. Therefore, every unit <sup>16</sup> education designed teaching plan, implemented the process of teaching, and assessed it in order to improve the efficiency and effectiveness of students' competence achievement. Furthermore, one of the principles of teaching that should be used is developing and balancing *hard skills* and *soft skills*. This study also found that international teaching had focused on teaching mathematical thinking. Hence, Indonesia should shift their focus from 'content-based teaching' to 'mathematical thinking' (As'ari & Kurniati, 2019).

Towards the principle of teaching in elementary and junior high school, students in high school should be equipped with *soft skills* development during the process of teaching. Besides, *soft skills* contributes to the construction of one's personality, hence, teachers needed to develop students' *soft skills* during their teaching process (Ngang, Yunus<sup>1</sup> & Hashim, 2015). *Soft skills* is a set of attributes of personality, both interpersonal and intrapersonal skills. Zhang (2012) defined *hard skills* and *soft skills* as follow: "*hard skills are the technical skills required to perform a certain type of task, and soft skills are interpersonal skills, such as communication, teamwork, and conflict management*". Furthermore, *soft skills* referred to life skills, both intrapersonal and interpersonal (Elfindri & Dkk, 2010). Teachers' quality and competence are two important aspects that affect the achievement of students' competences (Gichuru et al., 2016)

*Soft skills* relate to interpersonal aspects. Hence, it refers to individual's capability to interact with others. These skills are quite difficult to be measured. However, it is observable through how an individual interacts with others. Teachers play an important role to develop their students' *soft skills*, which become fundamental in mathematics course. They should give some contents of *soft skills* education during their teaching process (Hidayati, 2014). The importance of implementing *soft skills* education is not solely for students, but also teachers. As an instructor, teachers should at first have *soft skills* that students may adopt through behaviors. During a teaching process, teachers do not only embed the concepts of courses, but also assist their students to make decisions appropriately, control their emotion, avoid any negative behaviors, and live harmoniously with their friends (Alrajeh & Shindel, 2020).

Students need to learn mathematics, since it is a strong, thorough, and explicit means of communication. Communication skill is useful to express any abstract objects of mathematics. Mathematical objects involve facts, concepts, operations, and principles. Both mathematical communication and teaching mathematics <sup>3</sup> are important. Sumarmo (2000) explained that mathematical communication involved (a) connecting concrete objects, figures, and diagrams to mathematical ideas; (b) explaining ideas, situations, and mathematical relations either verbally or in written using concrete objects, figures, graphics, and algebra; (c) revealing daily events using mathematical language or symbols; (d) listening to, discussing, and writing mathematics; (e) reading by understanding a written mathematical presentation, making conjectures, constructing arguments, formulating definitions and generalization; (f) describing and making questions about learned math course (Sumarmo, 2000). Mathematical communication is not only verbal, but also non-verbal. As a language, mathematics is likely to be delivered in written way that represents non-verbal communication. One attribute of *soft skills* <sup>12</sup> that prospective math teachers should have is verbal and non-verbal math communication. The result of a study showed that the description of verbal math communication by prospective math teachers in their teaching practices is articulating the names or terms of mathematical objects in correct and clear ways (Hidayati, 2016a).

One essence of *soft skills* is time management (Sucipta, 2009). Time management is a general skill that help human to use their time in most effective and productive ways. It refers to developing a process and means to improve their efficiency and productivity. Hidayati (2016b) suggested that an efficient and systematic management of time which improved its productivity effectively involved planning, organizing, driving, and monitoring the productivity of time. Time is a source of performance, and its effectiveness appears from the achievement of goals in predetermined time.

One attribute of *soft skills* that relates to intrapersonal aspect is stress (Hidayati, 2016b). Stress

management is a capability to control self-emotion. Teachers should be able to interact and manage their students who have various personal characters. In teaching mathematics, students are directed to have teamwork with their classmates. It aims to develop their initiative. Every student has strengths and weakness. However, they should have role models in their daily routines to develop their initiative. Teachers should also teach them to control their emotion, avoid any negative behaviors, and be capable to live harmoniously with others (Alrajeh & Shindel, 2020).

The description of competence for junior high school level, as mentioned in the Regulation of the Ministry of Education and Culture No. 21/2016 about the standard of content for elementary and junior high school levels, shows that the basic competences of skills consist of reasoning, processing, and presenting in: effective, creativity, productive, critical, autonomous, collaborative, and communicative ways as well as giving solutions for problems in both concrete and abstract domains related to the elaboration of what students learn in school, and make them able to use methods in accordance to the principles of science (Kemendikbud, 2016). Furthermore, three important aspects in *soft skills* are communication, problem-solving, and intrapersonal skills. Developing the aspects of *soft skills* can be integrated with the substances of lesson. It indicates that the attributes of *soft skills* are likely to be integrated with mathematics teaching (Widarto, 2011). The process of teaching mathematics needs to involve *soft skills* within to encourage students to develop their *soft skills*. Moreover, implementing *soft skills* education may encourage students to have a will in learning, teamwork, communication, creativity, critical thinking, problem solving, leadership, self-development, interaction, and any other skills and proficiency, given that teachers should also create a conducive circumstance and meet the needs of students' emotions (Ruzek et al., 2016).

*Soft skills assessment is a new and as yet underdeveloped domain* (Kechagias, 2011). *Soft skills* are more dominated by components of individual's personality which procedures of measurement is a bit different from components of individual's ability (Widhiarso, 2009). Therefore, measuring *soft skills* refers to individual's internal characteristics. *Checklist* is a kind of measurement instrument for affective or behavioral aspects. It contains some indicators which are usually in the form of adjective or behaviors filled in by assessors. In relation to *soft skills*, checklist is a good instrument to measure the dimension of students' behaviors such as how they present their articles, how they interact with others, and their strategy in solving problems. Moreover, *peer evaluation* between students usually uses *checklist*. However, the development of *soft skills* has been encountering a lot of obstacles this far. One factor of its failure is due to the big class, academic focus, and inadequate periods of training (Ngang, Chan, & Vetriveilmany, 2015). Meanwhile, some factors that affect individual's *soft skills* transferring are employment, social support, and other factors related to teaching organization (Botke, Jansen, Khapova, & Tims, 2018).

The attributes of *soft skills* consist of two categories; intrapersonal and interpersonal skills. Intrapersonal skills involve management of time, management of stress, management of changes, character of transformation, creativity and critical thinking, having positive objectives, and fast learning. On the other hand, interpersonal skills include the capability of motivating, leading, negotiating, presenting, communicating, networking, and public speaking. This study focused on identifying high school students' *soft skills* attributes that teachers developed in math class. Those attributes were (1) verbal math communication, (2) non-verbal math communication, (3) time management, (4) stress management, (5) creativity, (6) critical thinking, (7) teamwork, and (8) problem-solving (Attakorn, Tayut, Pisitthawat, & Kanokorn, 2014; Ngang, Yunus, et al., 2015; Singh Dubey & Tiwari, 2020). Theoretically, these eight attributes of *soft skills* were likely to be developed for high school students, particular to mathematics course. Based on the standard of education assessment mentioned in the Regulation of the Ministry of Education and Culture No. 23/2016, the assessment of students' learning outcomes for elementary and junior high school levels involves the aspects of attitudes, knowledge, and skills. Attitudes and skills are the subsets of *soft skills*, while knowledge refers to *hard skills*. The urgency of this current study proposed that *soft skills* and *hard skills* were two fundamental domains that should be developed in teaching and learning activities, and the result would be measured using an instrument in order to collect any information related to teaching-learning process that had been organized. Overall, this study aimed to identify the attributes of *soft skills* that teachers developed in mathematics course for high school students.

## Method

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This study was descriptive-qualitative research. It was relevant to the objectives of this study which aimed to describe the attributes of *soft skills* that teachers developed in mathematics course. We revealed and figured out an illustration about *soft skills* attributes that teachers developed in mathematics course through a thorough observation recorded using *handycam*. Furthermore, questionnaires were distributed to teachers and students as well before organizing an in-depth interview with them. We explored how they explained the materials delivered in verbal and non-verbal ways, their attitudes, and any other circumstances during mathematics course. We also described every data collected based on actual facts.

We took two subjects for this study. Subject 1 (S1) was a mathematics teacher from SMAN 3 Jombang, and subject 2 (S2) was a mathematics teacher from SMAN 1 Pare, Kediri. They were selected through purposive sampling technique in order to correspond to the objectives of this study. For the criteria, the subjects should be those who had face-to-face/offline course meeting and taught the same grade. We considered teachers who had offline meeting since we had to observe and interview them directly in order to get the attributes of *soft skills* that they developed in their teaching.

The main instrument of this study was the researchers selves while using observation sheet, guidelines of interview, and teacher as well as student questionnaires as the supporting instruments. We used observation sheet to see directly how the subject did their teaching and to collect the real data of *soft skills* attributes that they develop in their teaching. Semi-structural interview aimed to reveal more about the *soft skills* attributes they developed. The Questions could be like "how to develop the attributes of *soft skills* in mathematics course?", "what *soft skills* attributes do they develop in mathematics course?", and "What is the reason of developing the attributes of *soft skills* in mathematics course?". Soft skill attribute indicators in this study are shown in table 1. Questionnaires for teachers aimed to get the consistency of *soft skills* attributes they developed in mathematics course and for the sake of data triangulation. Meanwhile, questionnaires for students aimed to get information of *soft skills* attribute percentage by students during mathematics course.

**Table 1.**  
Indicator of Attribute Soft Skill

Attributes of <i>soft skills</i>	Indicators
Verbal communication	math (1) the articulation of names/terms in discussed mathematics course such as symbols or notations, concepts, definitions, and operations; (2) the voice volume in articulating the names/terms of discussed math lesson such as symbols or notations, concepts, definitions, and operations; (3) different intonation in articulating names/terms in discussed mathematics course, such as symbols or notations, concepts, definitions, and operations; and (4) the clarity of articulating any sentence structures related to names/terms such as symbols or notations, concepts, definitions, and operations in mathematics course
Non-verbal communication	math (1) the clarity of writing names/terms such as symbols or notations, concepts, definitions, and operations on the answer sheet or whiteboard or slides of presentation in mathematics course; and (2) the sufficiency of writing names/terms such as symbols or notations, concepts, definitions, and operations on the answer sheet or whiteboard or slides of presentations in discussed mathematics course
Time management	(1) the punctuality of teaching and learning; (2) completing tasks according to the predetermined agreement; (3) submitting the tasks according to the predetermined agreement; and (4) using time according to the predetermined agreement
Stress management	attitudes during presentation/discussion/question-answer during the teaching-learning process of mathematics course
Creativity that	(1) appreciations to students who successfully completed their

students should have for solving mathematical problems	given tasks using multiple ways; (2) new ideas that students proposed; and (3) correlating the recent and previous materials
Critical thinking	(1) identifying the elements of discussed materials; (2) evaluating the assumptions or notions of discussed materials; and (3) the clarity and interpretation of students' statements and ideas
Teamwork	(1) responsibility to accomplish group task collectively; (2) contribution to ideas and group discussion; (3) teamwork optimization; (4) commitment for group achievement; and appreciation to any ideas that each member proposed in discussion
Problem solving	(1) identifying the given problems; (2) making limitation of the problems; (3) defining alternative solutions; (4) defining the procedures of problem solving; (5) defining the result of problem solving; (6) giving chances for students to make conclusion; and (7) allowing students to give suggestion/recommendation from the solution they proposed

Data was collected to identify the attributes of *soft skills* the subjects developed in mathematics course. It was collected through some ways including (1) direct observation when the subjects delivered mathematics course, (2) questionnaires related to the attributes of softskills they developed, (3) in-depth interview to the subject in order to explore and confirm the result of observation and questionnaires, (4) data triangulation in order to get credible data related to *soft skills* attribute they developed in mathematics course, (5) student questionnaires related to *soft skills* attributes that the subjects developed in mathematics course. The result of student questionnaires was used as the percentage of *soft skills* attributes the students gained during mathematics course. After having data triangulation and considered credible, the data was analyzed in order to identify the attributes of *soft skills* that the subjects developed in mathematics course. The attributes of *soft skills* were considered *credible* if their percentage was higher than or equal to "always or not always" category.

## Finding and Discussion

### Data Credibility

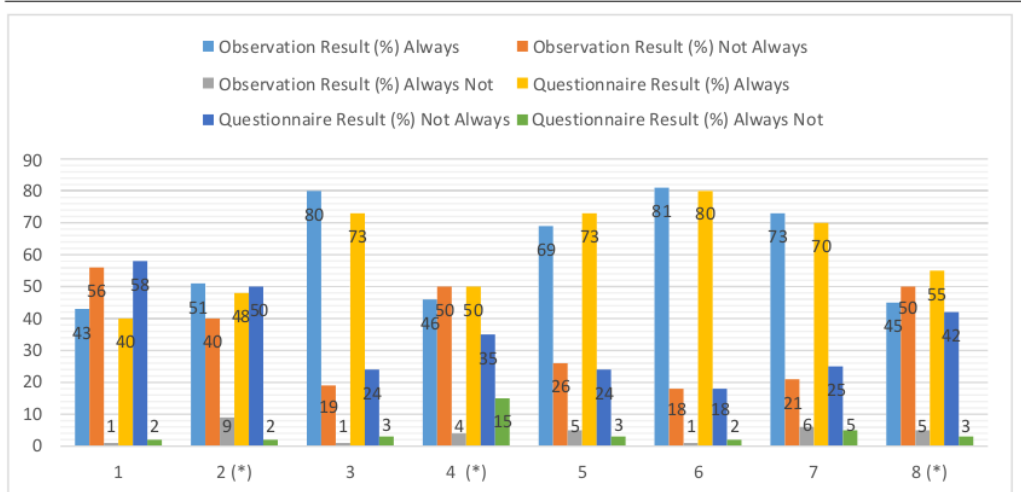
We compared the collected data of observation and questionnaires in order to confirm its credibility. Table 2 showed the data credibility of Subject 1 in mathematics course through triangulation method.

**Table 2.**

Data Credibility of Observation and Questionnaires on Subject 1 during Mathematics Course

No	Attributes of <i>Soft Skills</i>		Observation Result (%)			Questionnaire Result (%)		
			Always	Not Always	Always Not	Always	Not Always	Always Not
1	Verbal communication	math	43	56	1	40	58	2
2	Non-verbal communication (*)	math	<b>51</b>	40	9	48	<b>50</b>	2
3	Time management		80	19	1	73	24	3
4	Stress management (*)		46	50	4	50	35	15
5	Creativity		69	26	5	73	24	3
6	Critical thinking		81	18	1	80	18	2
7	Teamwork		73	21	6	70	25	5
8	Problem solving (*)		45	<b>50</b>	5	<b>55</b>	42	3

(\*) Not credible, since the high number of percentages was not in the same category.



**Figure 1.** Data Credibility of Observation and Questionnaire on S1 through Triangulation Method

**Note:**

- 1: Verbal math communication
- 2: Non-verbal math communication
- 3: Time management
- 4: Stress management
- 5: Creativity
- 6: Critical thinking
- 7: Teamwork
- 8: Problem solving

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Based on Table 1 and Figure 1, the slide of credible data to be analyzed in order to identify the development of *soft skills* attributes in mathematics course for high school students was verbal math communication, time management, creativity, critical thinking, and teamwork. *Verbal math communication* was considered credible since the result of observation and questionnaires showed the high percentage in "Not Always" category. Similarly, *time management* was considered credible due to the high percentage in "Always" category for both observation and questionnaires result. Furthermore, *creativity* was credible since it had high percentage in "Always" category for both observation and questionnaires result. *Critical thinking* was credible as it had the same high percentage in "Always" category for both observation and questionnaires result. *Teamwork* was credible since it had high percentage in "Always" category for both observation and questionnaires result.

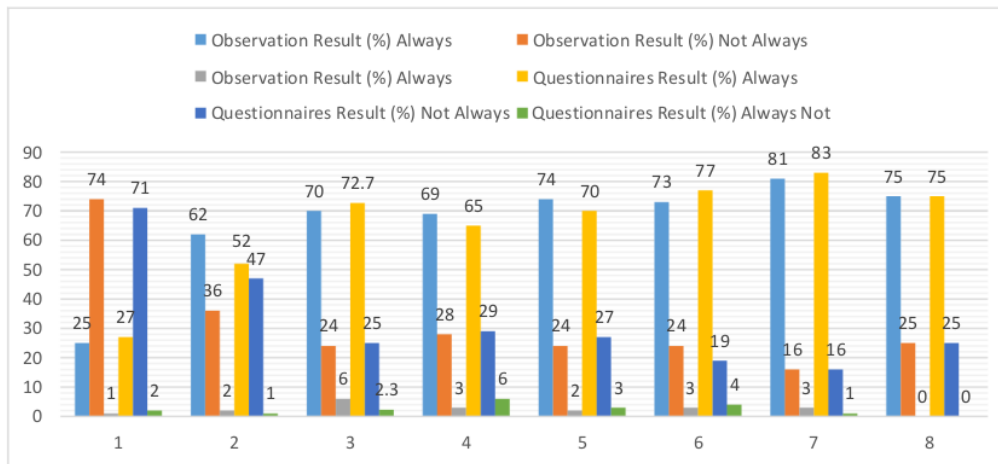
Towards Subject 2, we compared the collected data between observation and questionnaires distributed to her. The data credibility of Subject 2 in mathematics course through triangulation method was as follow.

**Table 2.**

Data Credibility of Observation and Questionnaires on Subject 2 during Mathematics Course

No	Attributes of <i>Soft Skills</i>		Observation Result (%)		Questionnaires Result (%)			
			Always	Not Always	Always	Not Always	Always Not	
1	Verbal Communication	Math	25	74	1	27	71	2
2	Non-Verbal communication	Math	62	36	2	52	47	1
3	Time Management		70	24	6	72.7	25	2.3

4	Stress Management	69	28	3	65	29	6
5	Creativity	74	24	2	70	27	3
6	Critical Thinking	73	24	3	77	19	4
7	Teamwork	81	16	3	83	16	1
8	Problem Solving	75	25	0	75	25	0



**Figure 2.** Data Credibility of Observation and Questionnaires on S2 through Triangulation Method

**Note:**

- 1: Verbal math communication
- 2: Non-verbal math communication
- 3: Time management
- 4: Stress management
- 5: Creativity
- 6: Critical thinking
- 7: Teamwork
- 8: Problem solving

Based on Table 2 and Figure 2, the slide of credible data to be analyzed in order to identify the development of soft skills attributes during mathematics course for high school students was verbal and non-verbal math communication, time management, creativity, stress management, critical thinking, teamwork, and problem solving. Verbal math communication was considered credible since it had high percentage in "Not Always" category for both observation and questionnaires result. Non-verbal math communication was considered credible due to its high percentage in "Always" category for both observation and questionnaires result. Time management was considered credible since it showed the high percentage in "Always" category for both observation and questionnaires result. Stress management was credible since it had high percentage in "Always" category for both observation and questionnaires result. Creativity was credible since it showed high percentage in "Always" category for both observation and questionnaires result. Critical thinking was credible as it showed high percentage in "Always" category for both observation and questionnaires result. Teamwork was credible as it had high percentage in "Always" category for both observation and questionnaires result. Problem solving was credible since it showed high percentage in "Always" category for both observation and questionnaires result.

**The Result of Student Questionnaires**

In addition to distributing questionnaires to teachers, we distributed questionnaires to students as well. the questionnaires consisted of some questions about the occurrence of the subjects' activities that reflected their soft skills The following table presented the result of student



questionnaires in the form of percentage.

**Table 3.**  
The Result of Student Questionnaires on Subject 1

No	Attributes of Soft Skill	Always (%)	Not Always (%)	Always (%)	Not (%)
1	Verbal Math Communication	68.5	26.42	5.08	
2	Time Management	82.93	16.06	1.01	
3	Creativity	59.35	36.31	4.34	
4	Critical Thinking	70.19	26.29	3.52	
5	Teamwork	61.63	31.7	6.67	

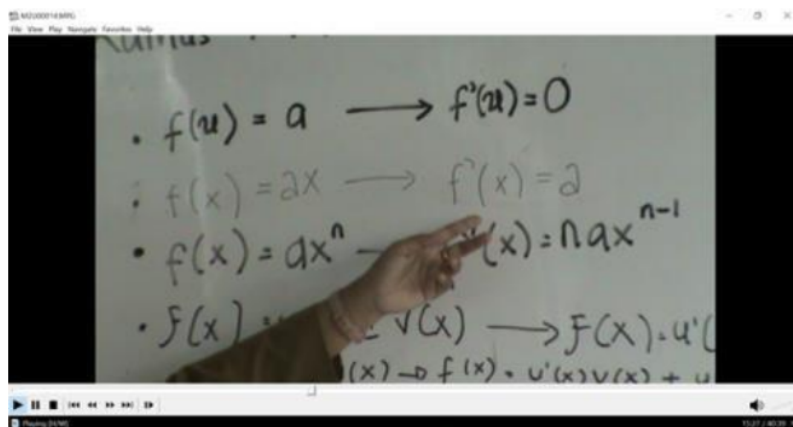
The data display in Table 3 showed that only five attributes of *soft skills* were considered credible as they appeared in her teaching activity and questionnaires. Those five attributes were then analyzed in student questionnaires. Towards *soft skills* attributes that Subject 2 developed, the result of student questionnaires related to those attributes was presented in the following table.

**Table 4.**  
The Result of Student Questionnaires on Subject 2

No	Attributes of Soft Skill	Always (%)	Not (%)	Always (%)	Always (%)	Not (%)
1	Verbal Math Communication	53.66	37.79	8.55		
2	Non-Verbal Math Communication	61.2	36.1	2.7		
3	Time Management	81.63	17.86	0.51		
4	Stress Management	76.87	21.77	1.36		
5	Creativity	59.1	36.6	4.3		
6	Critical Thinking	65.22	33.19	1.59		
7	Teamwork	74.45	23.5	2.05		
8	Problem Solving	81.77	17.74	0.49		

**Data Analysis of Subject 1**

Subject 1, the attributes of *soft skills* to be developed during mathematics course were: verbal math communication, time management, creativity, critical thinking, and teamwork. **Verbal math communication**, during mathematics course, the subject's voice was loud which made the students could easily listen to her explanation. Besides, the subject correctly articulated the objects of mathematics to be discussed.



**Figure 3.** Verbal math communication subject

Looking into the picture above, the subject also gave emphasis on particular objects of mathematics by repeating the terms *derivative of algebraic function*, *derivative of function  $f(x)$* . Furthermore, she appropriately pointed toward the mathematical object being discussed. The structure of sentence she expressed related to names/terms in the content of mathematics course being discussed was good and understandable.

**Time management**, the subject implemented her teaching activities on schedule. It appeared when she started and ended her teaching on time. In addition, it was based on the result of observation and student questionnaires.

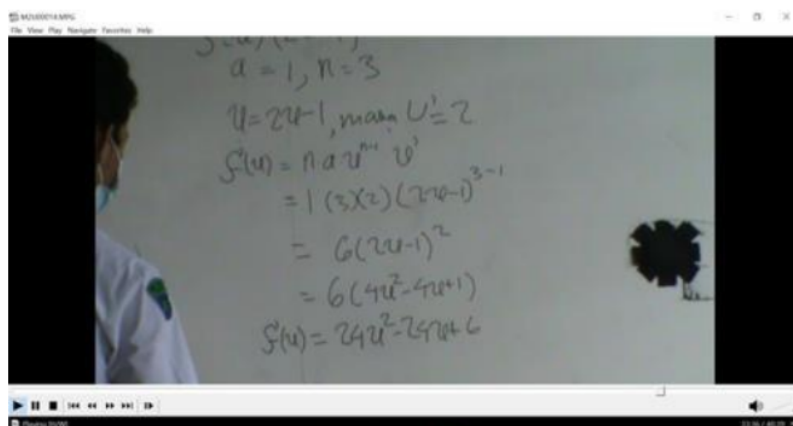


**Figure 4.** Time management subject

The subject also briefed her students in the beginning of her teaching. She asked her students to complete and submit their task on time based on the predetermined agreement. It appeared in the following excerpt of interview.

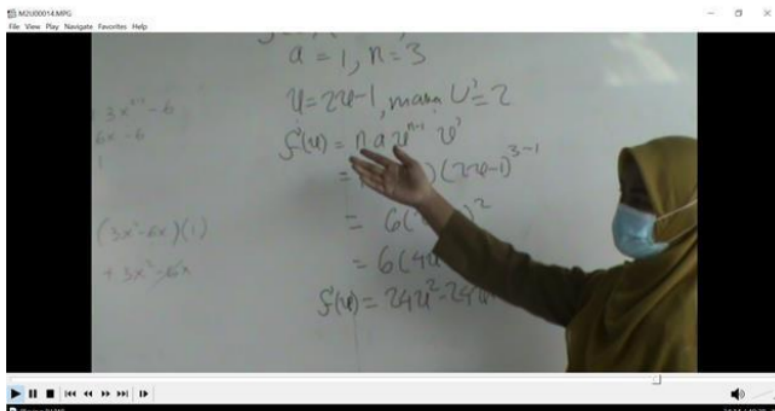
- Researcher : Why does reminding students to not late completing and submitting their task become your priority?  
 S1 : Because in this current pandemic Covie-19 era, we often find that students are late completing and submitting their tasks.

**Creativity**, the subject allowed her students to solve the given problem on the whiteboard.



**Figure 5.** Students solve the problem

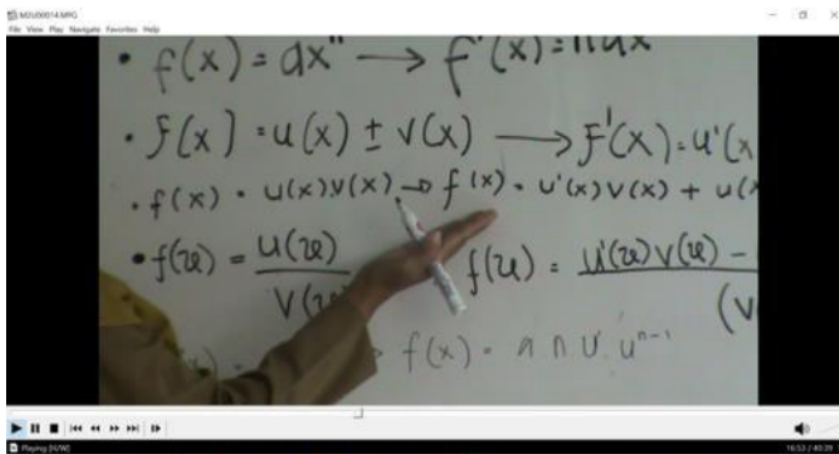
The picture showed a student who was completing a problem on whiteboard. He wrote the result by his own creativity.



**Figure 6.** Subject checked the students answer

Afterward, the subject checked her student's work on the whiteboard. She asked him, "Why  $n = 1?$ ", and the student responded, "No, Mam. I shifted it due to commutative attribute in multiplication. That's why I exchanged the position of  $n = 3$  with  $a = 1$ ." Considering her student's answer, the subject gave him appreciation by saying, "Good, you used commutative attribute to solve this problem." <sup>6</sup>

**The Critical thinking,** the subject asked her students to check the formula of algebraic function derivative that one student had wrote on the whiteboard. She allowed her students to express their ideas, and one of them responded that there was a wrong statement.



**Figure 7.** Subject checked the students answer

The subject encouraged her students to have confidence in expressing their thoughts. Then, she assisted them by pointing toward  $f(x)$ , and asked, "Is there any mistake here?". Responding the subject's question, one of the students answered, "It has no quotation mark, Mam. Derivative should be in the form of  $f'(x)$ ." The subject then responded her student's answer by saying, "Good, you are so thorough."

**Teamwork,** the subject allowed her students to solve the given problem with their desk mates. Due to pandemic Covid-19, however, they seemed reluctant to discuss with their classmates.



**Figure 8.** Teamwork by students

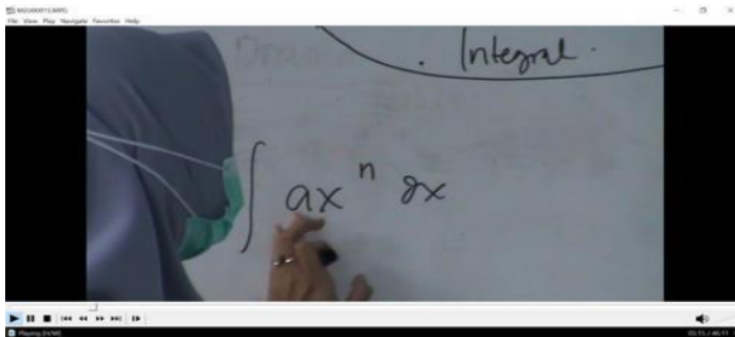
It was apparent that students prefer completing the given task individually due to the rule of physical distancing during pandemic Covid-19. It was also seen in the following excerpt of interview.

- Researcher : So, to develop teamwork and appreciation to one another, what did you do for it?
- S1 : I usually divided students into groups to complete a task. Due to pandemic Covid-19, however, they mostly complete their task individually without teamwork. If they should be in group, I ask them to submit their group work through WhatsApp group application.

### Data Analysis of Subject 2

Subject 2, the attributes of *soft skills* that S2 developed during her teaching activity were: verbal and non-verbal math communication, time management, stress management, creativity, critical thinking, teamwork, and problem solving.

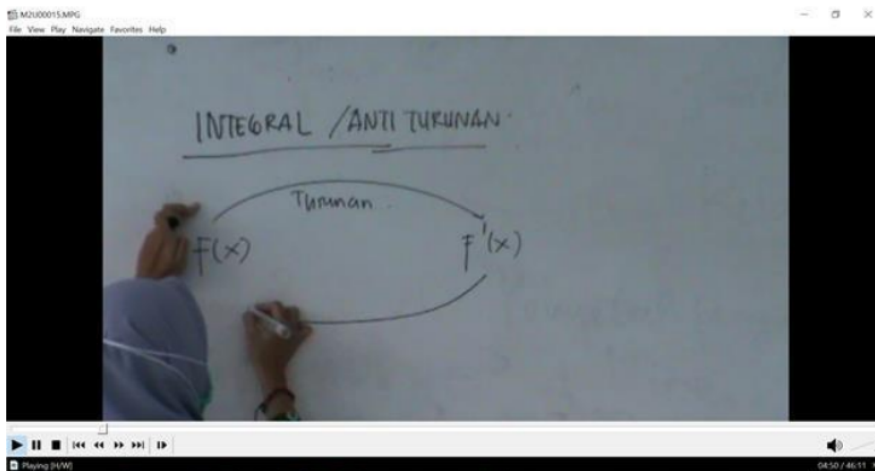
**Verbal math communication**, the subject's voice was clear and well-listened by every student in class. She also gave emphasis on particular symbols or notation by using different intonation. Besides, she pointed toward the symbol or notation she wanted to emphasize.



**Figure 9.** Verbal math communication of subject 2

The picture above showed that the subject pointed toward symbol  $a$  and defined it as the coefficient of  $x$  to the power of  $n$ . Furthermore, the subject clearly articulated her writing "integral  $ax$  to the power of  $n dx$ ." The structure of statement she expressed was also understandable.

**Non-verbal math communication.** It was apparent that the subject's writing related to particular object of mathematics she delivered was clear and readable. Hence, her students easily understood the material being discussed as it was systematic.



**Figure 10.** Non-verbal math communication of subject 2

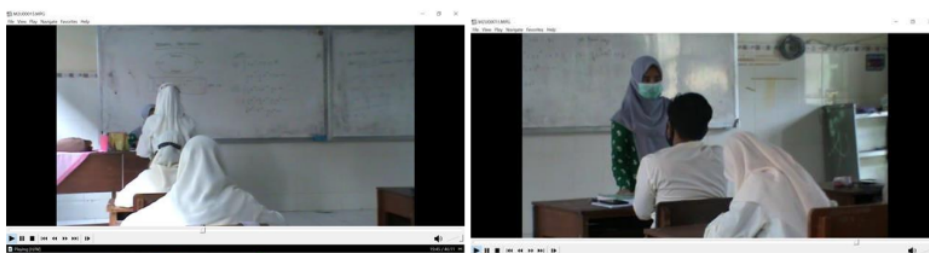
**Time management.** The subject implemented her teaching activity on schedule. We definitely confirmed it through direct observation during her class.



**Figure 11.** Time management by subject 2

While students were making notes, the subject reminded them to use time effectively in completing the given task.

**Stress management.** The subject allowed her students to ask if they did not understand the discussed material yet.



**Figure 12.** Stress management by subject 2

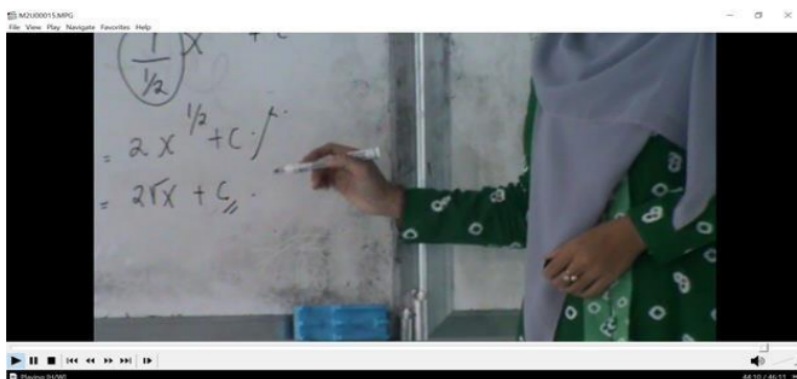
From the picture above, it was apparent that there was one student who directly asked particular

question to the subject. Moreover, she came forward to meet the subject. The subject then responded her by explaining what she did not understand yet.

The subject also approached the student who asked her in personal. She did it to make her student not feel psychologically insecure. It was consistent with the following excerpt of interview.

- Researcher : Could you give me an example of how you assist your students who seem confused with the material that you deliver?
- S2 : Yes, of course, I usually assist them in personal, so that they won't be shy and insecure. I approach their desk while motivating them to keep enthusiastic in learning. Some students, sometimes, come to me personally for asking some questions.

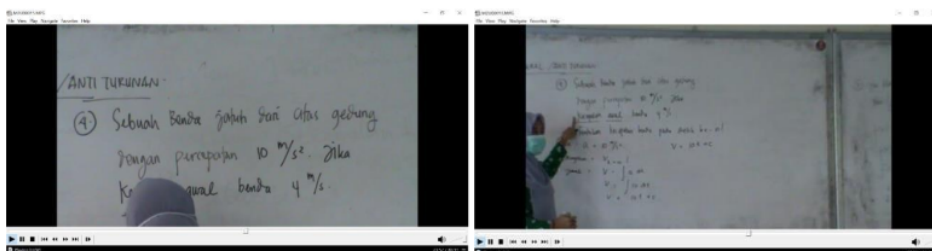
**Creativity.** The subject acted as a role model for students to be creative in solving problems.



**Figure 13.** Creativity by subject 2

She asked her students to define the final result using another format that  $2x$  to the power of one half, and a students responded by stating that  $2x$  to the power of one half could be turned into two was multiplied by the root of  $x$ . She then gave her appreciation by saying "smart" to that student.

**Critical thinking.** The subject gave some tasks related to daily life and she correlated those tasks with physics that involved velocity and acceleration.



**Figure 14.** Subject 2 gave the problem

The subject then allowed her students to complete the tasks by giving a hint related to physics. She asked them to solve the problem out of mathematics. However, it had correlation with *integral*. Afterward, she asked her students to have discussion. She asked them to identify things that should be identified and questioned from the given problem. Next, she asked them to discuss the solution together.

**Teamwork.** The subject asked her students to be in group with their desk mates, while still considering the medical protocol of physical distancing due to pandemic Covid-19.



**Figure 15.** Teamwork by students

She gave her appreciation to groups that could successfully complete the given task. She monitored each of the students who worked in group.

**Problem solving.** The result of observation showed that the subject gave a task that students should complete, as follow.



**Figure 16.** Subject's problem solving

The subject gave an *integral problem in the form of root*. She asked her students to have discussion, and one of them asked, "Why the format is changed into one half powered?" Responding the question, the subject explained by reminding them the previous material, that *root could be changed into exponent*.

Next, the subject asked them to discuss again, that *the integral of one which was divided by x to the power of one half dx could be changed into what?* Responding this question, a student addressed that *one half powered could be changed into integral x to power of minus one half dx*. Another finding of this case was that the subject corrected the answer by repeating that *integral x to the power of minus one half dx should be integral x to the power of negative one half dx*. According to the result of interview, the subject usually said that students often did not realize to differ the terms between *negative* and *minus* in mathematical operation. The students had time to complete the given task individually before having a class discussion.

Verbal math communication of subject 1 was supported by the result of questionnaires distributed to 147 students. 68.5% of the students testified that the subject gave more emphasis on the object of mathematics being discussed with different intonation. Moreover, they claimed that her explanation was clear and understandable. It was consistent with a previous study that teachers who used high intonation in their explanation would make their students more focus and get involved in the process of teaching and learning (Caranfil, 2017). Time management of subject 1 was supported by the result of questionnaires distributed to 147 students. 82.93% of the students testified that the subject always delivered the course on schedule, given that she wanted her students to complete and submit their task on time as their predetermined agreement. Creativity of subject 1 was supported by questionnaires distributed to 147 students. 59.35% of them testified that the subject gave her appreciation to the students who could complete the given task correctly with multiple ways. She also gave her appreciation to the students who expressed their

ideas with their own words and were capable to correlate the current discussed material with the previous one. This was consistent with a study suggesting that teachers should think some alternative answers or thoughts their students might show in solving the given problems. Therefore, teachers should be able to let their students define the strategy of problem solving independently by their own creativity (Yunianto, Indra Prahmana, & Crisan, 2021).

Critical thinking of subject 1 was supported by questionnaires distributed to 147 students. 70.19% of them testified that the subject gave her appreciation to the students who could identify the element of materials being discussed, those who could evaluate the assumption or notion of the material being discussed, and those who could respond another student's answer. It was consistent with a previous study revealing that teachers' competences would be helpful to encounter problems of teaching by identifying their students' mistakes in solving mathematical problems, encouraging their students to have critical thinking, and assessing their students' works (Podkhodova, Snegurova, Stefanova, Triapitsyna, & Pisareva, 2020). Students team work was supported by questionnaires distributed to 147 students. 61.63% of them testified that the subject gave her appreciation to the teams that were responsible on completing the given task in group. Furthermore, she also gave her appreciation to the students who actively contributed to group discussion, those who appreciated each member's thought in discussion. It was consistent with a previous study suggesting that the effectiveness of students' performance in teamwork might give positive impact on their emotion and communication skills (Daher, 2020).

Verbal math communication that S2 developed in her teaching activity was clear and understandable. It was supported by questionnaires distributed to 123 students. 53.66% of them testified that the subject gave different intonation to particular object of mathematics she wanted to emphasize in order to make it clear. It was consistent with a previous study revealing that teacher's intonation might affect the level of students' attention (Caranfil, 2017). Nonverbal math communication was supported by questionnaires distributed to 123 students. 61.2% of them testified that they could easily understand what subject wrote related to the material being discussed. Teachers' competence in communication played an important role, particularly their clarity in delivering materials. The high percentage indicated that students could easily understand the given material. Therefore, it concluded that the subject had good verbal math communication. It was consistent with a previous study suggesting that one important attribute of *soft skills* was communication skills (Ngang, Hashim, & Yunus, 2015).

Time management subject 2 was supported by questionnaires distributed to 123 students. 81.63% of them testified that the subject always taught on time and asked them to complete the given task on time as well. Stress management subject 2 was supported by questionnaires distributed to 123 students. 76.87% of them testified that the subject always assisted the students who seemed not understanding the material by approaching them personally and showed them nice expression, which made them confident to ask. The subject's attitude that gave motivation and assisted her students was consistent with a previous study suggesting that teachers should become a good observer and assessor simultaneously for their students. Additionally, they should give motivation to prevent their students from any negative attitudes (Trowler, 2015; Zepke, Leach, & Butler, 2014). Creativity of subject 2 was supported by questionnaires distributed to 123 students. 59.1% of them testified that the subject always gave her appreciation to the students who complete the given task correctly through multiple ways. She also gave her appreciation to the students who could correlate the current material with the previous one. Hence, teachers should allow their students to independently select the strategy of problem solving they wanted to apply (Yunianto et al., 2021).

Critical thinking of subject 2 was also supported by questionnaires distributed to 123 students. 65.22% of them testified that the subject always encouraged her students to have critical thinking. She gave appreciation to the students who could identify the elements of material being discussed. In this case, she developed innovation of teaching by integrating students' critical thinking with teamwork. It was an important soft skill that teachers should develop (Kanokorn, Pongtorn, & Sujanya, 2014). Team work formed by subject 2 was supported by questionnaires distributed to 123 students. 74.45% of them testified that the subject always made group discussion in her mathematics class. She always gave motivation while her students were working in group. She also gave appreciation to the students who could complete the given task in group. This attribute of soft skill had quite high percentage<sup>19</sup> was consistent with another study which found that communication skills and teamwork played an important role in the process of teaching (Ngang, Yie, & Shahid, 2015). Besides, communication and teamwork should be further developed, as learning mathematics did not only need skills of calculating, but also critical and



systematical thinking to solve new problems and study new ideas that students might encounter in the future (Iffah, Sutawidjaja, Sa'dijah, & Subanji, 2017).

Problem solving subject 2 was supported by questionnaires distributed to 123 students. 81.77% of them testified that the subject always gave problems related to the material being explained, and asked them to make it as the material for discussion. Furthermore, she gave her appreciation to the students who could identify anything that should be identified and questioned on the given task, as well as those who could correlate the current material being discussed with the previous one. Additionally, she gave many problems to be solved by her students. It aimed to drill their critical thinking as well as creativity in mathematics course (Center, 2010; National Education Association, n.d.).

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## Conclusion

Based on the result of data analysis and discussion, it apparently found that Subject 1 had already developed some attributes of soft skills such as verbal math communication, time management, creativity, critical thinking, and teamwork in her mathematics teaching activities. It was supported by the result of student questionnaires and interview with subject. Towards Subject 2, it found that she developed some attributes of soft skills such as verbal and non-verbal math communication, time management, stress management, creativity, critical thinking, teamwork, and problem solving in her mathematics teaching activities. It was supported by questionnaires distributed to some students and interview with subject. For other researchers, they can develop similar research by adding soft skills attributes that can be developed in learning mathematics.

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