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Phenomenological Study of Students' Psychomotor Ability in Practicum Learning Using Nvivo Software

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Abstract

The Covid-19 pandemic caused teachers to experience difficulties in assessing students' psychomotor abilities in online learning. Application of learning practicum activities with strategies to improve student skills and assist teachers in assessing their psychomotor abilities. This study aims to determine the psychomotor abilities of students on the rate of reaction during practicum learning activities at SMAN 8 Semarang. The basis of this study was the use of qualitative methods with a phenomenological approach. The sampling technique applied was purposive sampling with a sample of 14 students of class XI MIPA 5. Data were collected through observation, interviews, and documentation. The results of data analysis with the help of NVIVO software showed psychomotor skills with different levels of ability in the aspects of moving, manipulating, communicating, and creating. However, the difficulty lies in all sub-indicators of psychomotor abilities, including the ability to measure volume, measure solution temperature, listen to opinions, analyze problems, and compile practicum reports.

1. INTRODUCTION

The Covid-19 pandemic has forced people to work, study, and pray from home. This is unoptimal in circumstances that provide limitations to the ongoing learning process activities. Most teachers are still unfamiliar with implementing digital platforms. Therefore, teachers often only apply conventional methods of learning by offering assignments to students (Prawanti, 2020). This causes most students only understand concepts or theories in learning material. Currently, most regions in Indonesia have followed a new way of life, namely the new normal era (Hana et al., 2021), in which the government allows learning

systems that integrate online and offline learning to be carried out by educational institutions located only in the green zone areas.

The psychomotor domain focuses on physical skills and muscle function in their development and emphasis various movements, such as emphasizing the physical response of manual skills. This ability shows the level of proficiency in carrying out a set of tasks. The output of learning outcomes in the psychomotor domain is special movement skills obtained after experiencing a learning event. According to Trowbridge in Elly (2009), aspects that are often evaluated in learning science include moving, manipulating, communicating, and creating. These aspects of psychomotor skills are often used in making decisions based on the information obtained and extent to which the program has been achieved by someone in learning science. Movement skills in psychomotor abilities are applied to chemistry, one of which is the reaction rate material, which involves practicum-based learning.

Reaction rate material includes science learning which is closely related to practice to help understand the concept. There are difficulties in understanding the concept, the application of practicum activities as a complement to fulfilling the rules of learning science which emphasizes direct experience to understand nature scientifically. Therefore, practical learning is very appropriate when applied to the reaction rate material. Based on preliminary research studies, it is necessary to use practicum methods for the learning process. This study provides further reinforcement for taking blended-based learning methods. The application of blended learning as a solution in improving students' psychomotor abilities with the help of practicum methods, in addition, the processing computer-assisted qualitative analysis is something new.

The application of qualitative research in this study used the Nvivo software which was able to facilitate teachers to conclude data and link data from one datum to another. Nvivo software is a category of computer-assisted qualitative data analysis software (CAQDAS) that has several capabilities so that researchers can link items, code, perform queries, annotate, and map research data (Sidik and Mulya, 2011). This study aims to determine the phenomenological study of students' psychomotor abilities in practicum learning using the NVIVO software at SMAN 8 Semarang.

2. METHOD

Research Approach

The basis of this research was the use of qualitative research methods with reference to research procedures that obtain qualitative data in the form of statements or notes from data sources, such as behavior during the observation process. The use of a phenomenological approach to qualitative methods explains that phenomenology is a science that is oriented toward producing descriptions of visible reality. The sampling technique applied in this study used a purposive sampling technique. The requirements that must be met to determine the sample were that the informant had carried out practical activities at least once, both online practicum and face-to-face practicum. The data that had been classified could then be processed using the Query, Explore and Analyze feature. These features might increase the validity of qualitative research data analysis, which has been a weakness of qualitative methods.

Research Design

The initial stage conducted by the researcher was to formulate a problem statement and to connect it to the literature study and accompanied by pre-research to develop concepts that applied as a reference in research, then at the next stage development was carried out in the form of an initial research model. Preparation of instruments by researchers to be used in field studies, namely guidelines for interviews and observation activities. In the next stage,

the researcher conducted observations and interviews by accompanying practicum activities on the material of the rate of reaction for 4 meetings in class XI IPA 5. All informants received questions in the same order and could answer in the same way free. The tools used by researchers in documenting the data submitted by 52 informants in the form of words and sentences can use a voice recorder. The results of the observations and interviews were then transcribed back in writing to process the data analysis using the NVIVO software. In the next process, the researcher conducted a description by communicating the results of the transcription to students as a form of confirmation from both parties. This process aims to avoid falsification of data collected. The discussion obtained from the results of the data analysis was used to explain research findings and the relevance of the answers to questions in the formulation of problems determined from the start. The final results of the discussion were summarized in the research conclusions.

Data Analysis

The researcher carried out the analysis process by grouping the transcription results into the classification of psychomotor abilities, including moving, manipulating, communicating, and creating. The grouping of these categories aims to summarize the contents of the focus of analysis in qualitative research found in the data collection in the form of these sentences (Drisko and Maschi, 2016). Data analysis used to assist qualitative research is colaizzi analysis (Susilo, 2014).

Analysis of qualitative data in the form of text required coding to be used for a specific purpose. The final result of using the NVIVO Software was that researchers transformed the visualization of the data obtained into scientific discourse expressions regarding the psychomotor abilities of students in XI IPA 5 class SMAN 8 Semarang.

The data obtained were categorized based on the Nodes in Table 1. The psychomotor abilities of students were explained in predetermined psychomotor aspects according to the codes that had the meaning of the sub-indicators. The following is a codification of the psychomotor aspects observed by researchers in the activities of groups I, II, III, and IV in the practicum of the effect of a catalyst on the rate of reaction.

Table 1. Code for each practicum sub-indicator of the effect of the catalyst on the reaction rate

No	Aspect	Sub-indicator	Code
1	Moving	Taking carefully all the tools and materials required in the practicum process	Moving 1
		Wearing personal protective equipment before carrying out practicum activities	Moving 2
		Able to carry out procedures or practicum work steps in accordance with practicum instructions	Moving 3
2	Manipulating	Labeling the practicum tools	Manipulating 1
		Measuring the volume of H_2O_2 5% as much as 5 ml during the practicum.	Manipulating 2
		Giving 2 drops of 0,1M NaCl solution during the practicum	Manipulating 3
		Giving 2 drops of 0.1M $FeCl_3$ solution during the practicum.	Manipulating 4
		Observing the rate of emergence of gas bubbles	Manipulating 5
		Cleaning tools and materials of the practicum after use	Manipulating 6
3	Communicating	Asking question	Communicating 1
		Listening to opinions or presentations from	Communicating

		other groups	2
		Discussing problems	Communicating 3
		Recording data or information	Communicating 4
		Delivering the results of the data obtained during the practicum accompanied by an explanation	Communicating 5
4	Creating	Analyzing the problem	Creating 1
		Preparing practicum reports	Creating 2

The output issued was in the form of a project map from the codification of psychomotor aspects. The project map presented in Figure 1 was displayed again in a more detailed form regarding the average presentation obtained by students with their psychomotor abilities.

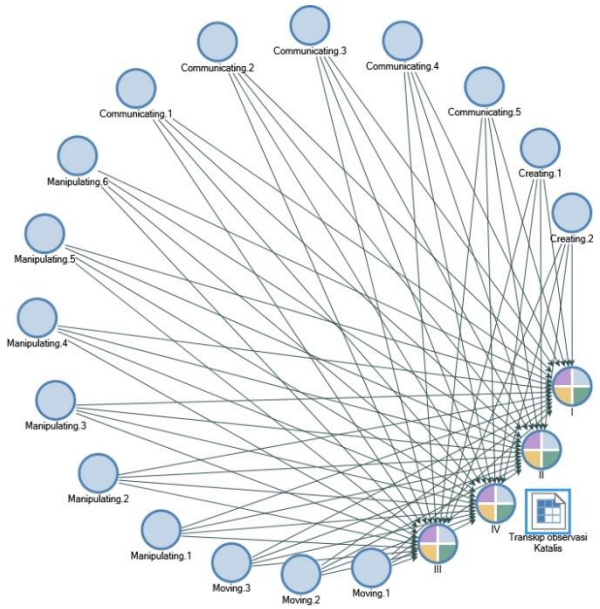


Figure 1. Practical project map of the effect of catalysts on reaction rates (Source: Nvivo 12)

3. RESULTS AND DISCUSSION

1. Moving Aspect

Observing students' psychomotor abilities in the moving aspect, the researcher conducted an assessment based on the students' behavior at the beginning of learning. The data observed in this aspect consists of 3 sub-indicators with their respective codes, namely moving.1, moving.2 and moving.3.

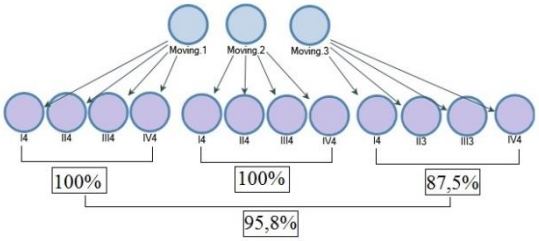


Figure 2. The percentage of moving aspects in the practicum of the influence of the catalyst on the reaction rate (Source: Nvivo 12)

Moving.1 explains the ability of students to take carefully the tools and materials required in the practicum process, the percentage obtained in moving.1 practicum. The effect of the catalyst on the reaction rate was 100%. The ability to work in teams by students can be the reason for obtaining relatively high score and the ability to divide tasks in taking tools and materials to be used in practicum can lighten the work of each individual. The psychomotor abilities of students in the moving.1 sub-indicator are included in the level of set-readiness. Set-readiness explains that students have focused on preparing themselves mentally, emotionally, and physically before starting practicum (Sofyan, 2006). When conducting interviews with all informants by presenting two selected pictures related to students' ability to carry reagent bottles, only one student answered it incorrectly by giving the reason that when the teacher prepared the materials to be used and brought reagent bottles, the students paid less attention. This problem indicates how important student readiness is before starting learning so that students must pay attention to the correct explanation or example from the teacher.

Codes moving.2 provides an explanation of the ability of students to use personal protective equipment (PPE) before carrying out practicum activities. According to the researchers' observations, all students used three Personal Protective Equipment, two of which were prepared by the school. The use of PPE when carrying out practicum activities has become a defense against the possibility of accidents (Natalia, 2020). The need for the completeness of PPE for students at the high school level (SMA) should be the responsibility of the school, so that in the scoring rubric with the highest results in the sub-indicator moving.2 students are only required to wear a maximum of three personal protective equipment (PPE). The existence of a profile analysis of students' psychomotor abilities can explain some problems in the institution studied by researchers, namely SMAN 8 Semarang and can also be a form of self-introspection in the next academic year.

The ability of students to carry out all stages of practical work according to the specified guidelines is part of the moving codes. 3. Based on the observations obtained, students had carried out all the work steps, but in the systematic work order of each group there was still a bit of haphazardness, so that the acquisition of observation data for moving.3 in each experiment carried out obtained different percentages. The percentage obtained in the moving aspect based on the explanation above is still relatively good when compared to the problems encountered by students during online learning.

Indirectly the practicum activities applied become student accommodation in helping them to understand the material on the rate of reaction. Another strategy that teachers can use in overcoming problems with students' abilities to carry out work steps correctly and systematically is by showing video tutorials before students start practicum (Linggasari, 2021). The video tutorial displays an explanation of the

work steps to be carried out and the teacher gives a little emphasis on the importance of paying attention to each step of the practicum work.

2. Manipulating Aspect

This aspect of manipulation is an early concern in the psychomotor behavior of students because the activity includes the coordination of body movements by involving two or more parts of the body (Elly et al., 2009). Activities in this aspect enter into skilled movements with the explanation that students can control various movement actions that are classified as complex and complicated with alacrity. Activities carried out directly with practicum tools can construct students' thoughts and discoveries while working so that the impression that is felt is fun and full of motivation (Lilis, 2015).

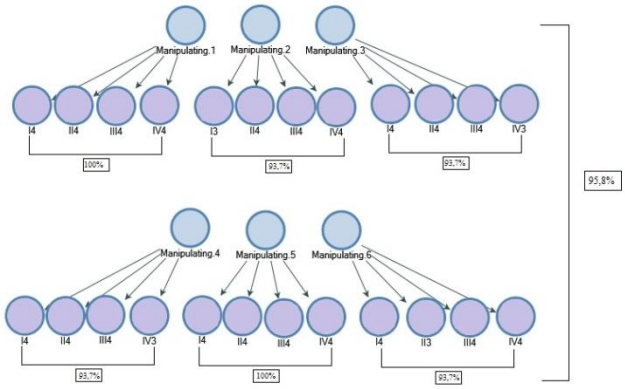


Figure 3. The percentage of manipulation aspects in practical work on the influence of catalysts on reaction rates (Source: Nvivo 12)

The first is manipulating.1, explaining labeling correctly and clearly. All groups have labeled the practicum tools used as a comparison between the tested solutions. Students consider that the labeling activities are on the easiest activities when compared to other work steps, so that the scores obtained from all groups are perfect. The importance of labeling when carrying out practical work as a tool to distinguish one solution from another, labels or signs must have bright or striking colors and bold fonts and are located in areas that can be seen clearly (Indrawan et al., 2020).

The second is the ability of students to measure the volume of the solution to be used, including the volume of $Na_2S_2O_3$, HCl, H_2O_2, and H_2O solutions. The description of the highest score for this ability is that students can measure the volume of the solution exactly as much as needed using a measuring cup and the help of a volume pipette. while how to use a measuring cup, namely by entering the solution to be used, how to read the scale on the measuring cup is better placed on media that is parallel to the direction of vision, it must be completely horizontal and not from above or below (Putri et al., 2018). Colorless solutions in their measurements must pay attention to the lower limit of the concave meniscus, while for solutions that are colored must pay attention to the upper limit of the meniscus. According to the results of the interview, the student's error is entirely caused by a lack of knowledge in measuring a solution. As stated by Natalia (2020) that the introduction of laboratory equipment is pivotal, so that students know how to use these tools properly and correctly, so as to minimize errors in the procedure for using the equipment. This action can provide an opportunity for students to get to know and practice a little using the tool properly. Practicum learning activities at the next meeting at the practical effect of the catalyst on the reaction rate of the

percentage obtain increased by 93,7%. This proves that learning activities before starting an experiment is an activity or psychic that can experience changes because it has a relationship with various aspects of personality, such as changes in the values of attitudes, skills, habits, and skills (Nani, 2004).

Manipulating.3 in the catalyst experiment on the reaction rate, namely giving 2 drops of $FeCl_3$ solution. This action obtained a percentage of 93.7%, on the grounds that group IV gave 4 drops of NaCl to the solution to be mixed. The discrepancy with the practicum instructions that had been set made group 4 get a score of 3 on the rubric for assessing their psychomotor abilities.

The observation of students in measuring the temperature of the solution. The temperature in a system is a parameter of the kinetic energy of the particles in that system. Therefore, when the temperature increases, the possibility of collisions will occur which results in a faster reaction rate (Setiyana, 2020). In the field conditions, the students were still unable to use the thermometer correctly at the start of the experiment. The description of the highest score from the observation rubric of psychomotor abilities in this sub-indicator is that students can measure the temperature of the solution correctly and use the thermometer correctly.

The correct use of a thermometer is to hold the rope at the end, not the body of the thermometer, so that the measured temperature is successful in obtaining accurate data. The reading of the thermometer scale must be perpendicular to the eye of the observer, not bent towards the table where the thermometer and beaker are placed, and also the thermometer immersed in the solution must not touch the walls or bottom of the beaker (Putri et al., 2018).

Codes manipulating.4 describes the ability of students to observe the speed at which gas bubbles appear. The percentage obtained was 100%. This is supported by the number of members in each group. Group learning certainly works together and helps each other between members (Emda, 2014), to observe the speed of emergence of a gas can take turns or observe each other simultaneously. Therefore, group learning can help ease the task of each individual.

Equivalent percentages were also obtained in codes manipulating.5 regarding the practicum of the effect of catalysts on reaction rates, namely the observation activities produced a value of 100%. The reasons obtained are in accordance with the information previously explained. In addition, students are very enthusiastic in this learning because they rarely carry out practicum activities in teaching and learning activities (KBM).

The manipulation aspect with the sub-indicator of students' ability to clean practicum tools and materials after use, this sub-indicator was applied in codes manipulating. 6 in the experiment of the effect of a catalyst on the reaction rate. The percentage obtained was 93,7%, which was a small error experienced by Group II, namely forgetting to dispose of waste that had been used in the place provided. The explanation obtained from the interview results was that in the activity of cleaning tools and materials, group II only relied on one friend and the members in the group consisted of 3 people, 2 people prepared practicum results to be presented while 1 person was responsible for cleaning all the tools and materials. The 4 activities assessed were cleaning tools and materials, namely disposing of chemical waste, washing tools and drying them with a cloth, returning tools that had been used, and disposing of trash in its place.

The stage of manipulating abilities possessed by students great affect the experimental results that will be obtained. It is pivotal in the learning process before carrying out practicum students deserve to be provided knowledge and simulation as an approach (Maria et al., 2008). Debriefing on how to use practicum tools

correctly. Based on the two descriptions of errors in measuring temperature and volume, students need a solution to the problem at hand. The right solution is when explaining material regarding the introduction of laboratory equipment, students are not only presented with pictures of laboratory equipment, but are given direct education about the workings of practicum equipment in the laboratory (Sakti, 2011). According to a study by Sapiruddin (2021), educational activities before conducting practicums can provide additional knowledge and strengthen a more real understanding to prevent or minimize mistakes made by students. This fact can be in accordance with the psychomotor ability itself, which is related to the ability to act after a person receives a learning experience (Sudaryono, 2012).

Mentoring activities are also very necessary to explain and accompany students in demonstrating practicum tools. Errors that occur in each group can also be caused by a lack of a mentor or assistant in assisting practicum activities. At yesterday's meeting there were only 2 assistants, namely a chemistry teacher and a researcher. Sapiruddin (2021) explained that assistance for each group has at least 1 mentor or assistant in carrying out practicums, so that students do not often experience mistakes and the practicum results obtained are in accordance with theoretical studies.

3. Communicating Aspect

Obtaining the results of direct observation by researchers is able to demonstrate the diversity of communication skills of students at XI IPA 5 class. This ability refers to explaining actions by providing statements and feelings for others to understand (Elly et al., 2009). The assessed sub-indicators in the observation process in this aspect are activities when asking questions, listening to opinions or presentations, discussing problems, recording data or information, and conveying the results of the data obtained. The sub-indicators in each experiment carried out by students have the same explanation so that in the communicating aspect it can be assessed whether there is an increase in each experiment. Data from the observations results on this aspect consist of 5 sub-indicators with each code namely communicating.1, communicating.2 and communicating.3, communicating.4 and communicating.5

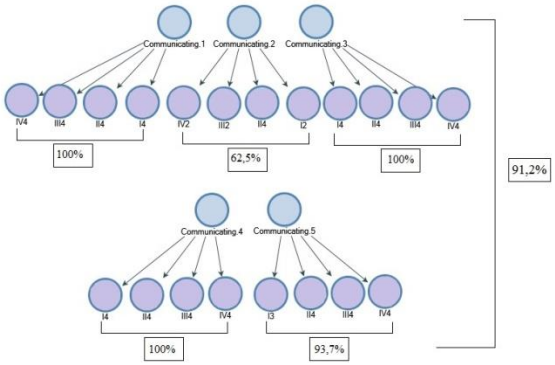


Figure 4. The percentage of communicating aspects in the practicum of the catalyst influence on the rate of reaction (Sources: Nvivo 12)

Codes communicating.1 explains the activities of students in asking questions. The criteria for asking questions carried out by students are that the first is asking for an explanation and the second is asking questions with a hypothetical background (Conny, 1992). The percentage on codes communicating.1 for experiments on the catalyst effect on the reaction rate was 100%. Students ask questions about what they do not understand by fulfilling the 4 indicators that have been set, namely related to the material, clear, bold, and easy to understand. Asking

activities carried out by students are more often included in the criteria for asking for an explanation. Asking for an explanation is the easiest thing for students to do because they do not hesitate to express it. In contrast to when asking questions using a hypothetical background, students need basic knowledge about the matter being studied, so students must imagine things that have never been conducted and then questioned (Winda, 2010).

Furthermore, the second code is communicating.2 which describes listening to opinions or presentations from other groups. Listening skills are the most basic abilities that students must have, if they have very good listening skills, it will be easier for students to talk about the material being explained (Situmorang, 2018). The percentage obtained in the experiment on the effect of the catalyst on the reaction rate was 62.5%. The decrease in the percentage results is seen from the lack of enthusiasm of the students in listening to the group presenting the results of their experiments. In the second and third experiments, many students are still daydreaming and chatting between group members in the lesson. This is supported by the documentation obtained by the researchers in the form of video recordings of the practicum learning process. Using visual data in qualitative research to obtain naturalistic with the naturalness of the situation during the research process (Dedi, 2020).

The visual data obtained in the activity of conveying the results of the data for the experiment regarding the catalyst effect on the rate of reaction shows that students better prepare the material to be used for presentations than listening to presentations from other groups, so in this activity learning looks a little less conducive. Therefore, the percentage obtained has decreased.

The next code is communicating. 3 which explains discussion activities with group mates. The percentage obtained from all experiments, both the effect of temperature, surface area and catalyst, obtained a value of 100%. Discussion activities in solving problems in practicum learning in each group have several categories observed by researchers, including: paying attention to ideas from group members and responding to them, presenting ideas in every problem that occurs, asking questions and writing the obtained results of the discussions (Apko, 2015).

The results of communication between group members show that students can build on the knowledge they have by connecting what is being observed and providing opportunities for students to think critically (Indah, 2020). After conducting the experiment, all groups are required to submit the results of the data obtained during the practicum, so that communication or exchange of ideas between group mates becomes more frequent. This activity is related to constructivism theory with the aim of learning is not just an activity of collecting data or facts, but a development of thinking by paying attention to a new knowledge framework (Hendriyan, 2013).

Codes communicating.4 describe observations by researchers to students regarding activities in recording data or information for temporary reports correctly and communicating with group mates. The percentages explained in the description of the research results show ed that the experiment the effect of temperature, surface area and catalyst on the reaction rate was 100%.

Observations obtained during the two meetings showed that students were very active during practicum learning and processing data for temporary reports which they could use as a basis for making final reports, so that many activities were recorder in them. Activities on this sub-indicator were carried out by one of the students as a group representative. Based on the collected interviews, each group divided the work tasks, some members conducted experiments and one member

recorded the results of the experiments. Thus, only one person wrote the results of the interim report. The division in completing tasks is a special supporting tool in building and fostering teamwork (Ita, 2021). The discussion also aims as a form of communication between students in charge of conducting experiments and students in charge of recording experimental data so that the data produced is in accordance with the material concept of reaction rate.

The last code is communicating. 5. The sub-indicators observed in communicating.5 were the students activities in conveying the results of the data obtained during practicum. Activities like this in learning activities are often called presentations. Presentation ensures that there is a process of transferring an idea or information and emotions using pictures, numbers, words, graphics, and symbols from a speaker to listeners with a more specific meaning (Hernawati and Amin, 2017). This intention emphasizes activities in a communication that make people able to think logically and have strong arguments.

The percentage in subsequent experiments, namely the effect of the catalyst on the reaction rate, decreased by 93,7%. In this activity, there are five conditions observed by researchers including: loud voice, fluency, confidence, ability to answer questions and neat appearance. There are four groups and one of the four groups only fulfilled 3 indicators, namely self-confidence, ability to answer questions, and neat appearance. The activity of answering questions from other groups has shown the ability to communicate scientifically with positive correspondence at the level of understanding concepts (Hernawati and Amin, 2017).

Presentation activities aim to express ideas or constraints in public, supported by discussion method, students can find solutions to problems together (Sukaedi, 2017). The discussion method is outlined in communicating aspects, such as answering questions, adding and understanding knowledge and being able to make decisions together (Zuni and Prasetiyo, 2017).

1. Creating Aspect

The use of creating aspects in learning, especially science subjects, requires various collaborations between moving, manipulating, and communicating aspects to produce new creations. The sub-indicators assessed in the observation process in this aspect are analyzing problems that occur during the practicum learning process to be included in the explanations in the report. The sub-indicators assessed also regarding accuracy in compiling practicum reports by fulfilling the 18 predetermined assessment aspects. The acquisition of the aspects of creating in the observation of researchers gets the lowest percentage when compared to the aspects of moving, manipulating, and communicating. The following is a detailed explanation of the two sub-indicators of the creating aspect.

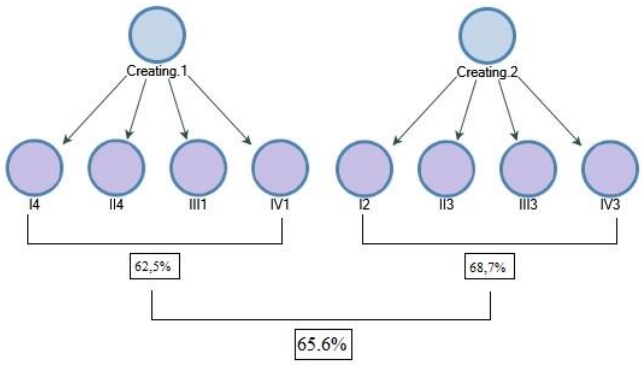
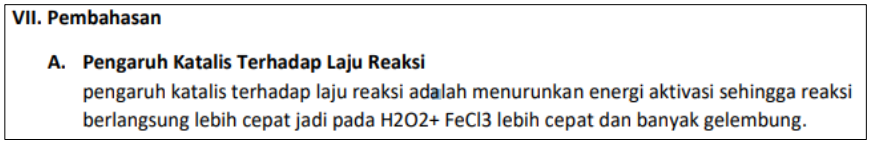


Figure 5. Percentage of creating aspects in practical work on the influence of catalysts

on reaction rates (Source: Nvivo 12)

The first sub-indicator was applied to codes creating.1, namely the ability of students to analyze problems. Assessment of students in analyzing the problems is in the practicum reports that have been written for each group. The assessment element lies in the discussion which contains the suitability of the results with the concept of reaction rate and the answers to the problems contained in the practicum instructions. Percentage of codes creating.1 in experiments on the influence of catalysts on reaction rates. The percentage obtained was 62,5%. The acquisition of this value can be observed in the lack of clarity in analyzing data and not associated with other literature. An example of discussing the effect of a catalyst on the rate of reaction in the laboratory report is presented in Figure 4.19.


VII. Pembahasan

A. Pengaruh Katalis Terhadap Laju Reaksi

pengaruh katalis terhadap laju reaksi adalah menurunkan energi aktivasi sehingga reaksi berlangsung lebih cepat jadi pada H2O2+ FeCl3 lebih cepat dan banyak gelembung.

Figure 6. Discussion in the group IV practicum report on the effect of the catalyst on the reaction rate

Based on the explanation of student reports which only shows the effect of a catalyst on activation energy and only discussed one indicator of the material used as a comparison in the experiment, it is considered incomplete in analyzing a problem. The function of the literature in practicum reports, especially discussions, is that it can be complementary, additional, and reinforcing information resulting from a hypothesis or analysis, by obtaining a theoretical basis that can support solving the problem being researched (Jarot 2020, accessed on March 31, 2022). The practicum report can provide an analytical explanation and only two groups can provide the appropriate practicum report results. Based on the opinions of students from the results of interviews that students still have difficulty discussing practicum reports, one of the reasons related to these assumptions is the lack of knowledge possessed so that the courage in making new creations or in providing significant explanations is still lacking. The conclusion regarding the relationship of the ability to analyze problems in each experiment depends on the understanding of the concepts, so that it can be seen from the devoted to the practicum report that it has its characteristics from each group.

Furthermore, it discusses the preparation of practicum reports by fulfilling the 18 predetermined assessment aspects. Based on the opinion of the students that the work on the practicum report for each group was partly carried out at school by way of discussion and some was done at their respective homes with a mutually agreed division. The preparation of practicum reports in each group had two experiments, groups I & II conducted experiments on the effect of temperature and catalyst on the reaction rate, while groups III & IV carried out experiments on the effect of surface area and catalyst on the reaction rate. The overall percentage of codes creating.2 was found to be 68.7%. This percentage is represented in the experiment on the effect of the catalyst on the reaction rate because all the groups being observed carried out the experiment. The observation results obtained for all groups still do not fulfill the 18 aspects of the practicum report preparation.

Observations in one group explained that the practicum report assessment only fulfilled 11 aspects. This indicates the inaccuracy of students in compiling reports. The report format has been presented on the initial sheet of practicum

instructions. Researchers and teachers have been reminded that practicum reports must be in accordance with predefined format.

Based on the discussion above by showing various details in each aspect contained in the psychomotor abilities of students at SMAN 8 Semarang, it shows that each meeting in practical learning explains a different percentage in each aspect. Thus, the aspect of the psychomotor abilities observed are several codes appeared as expected by the teacher and researchers, material through experiments and gain new experiences. While several codes are still low in the acquisition of scores including codes communicating.2, creating.1 and creating.2.

Various causes have been explained in the discussion above, one of the activities in which all groups still experience errors as in codes creating.2 is in compiling practicum reports. Based on the results of the interviews conducted by the researchers, indeed the students are still not used to making practicum reports, so this activity is regarded as a form of initial training in making reports.

Every student has psychomotor abilities (Jayanti et al., 2016), so the form of student training will refer to more optimal psychomotor abilities, students who often carry out practical learning will be more skilled in the science process being carried out. This is as explained by Elly (2009), who argues that psychomotor abilities are movement-oriented skills and emphasize physical reactions and hand skills, the skill itself shows the level of a person's expertise in doing a task. So this ability needs to be stimulated to show its identity.

Assessment of psychomotor abilities is an assessment carried out by the teacher to study the competency achievement of each student (Andi, 2014). In drafting the final results of psychomotor abilities in writing on the assessment system, teachers generally use observation sheets, rating scales, or portfolios (Agus, 2018). The advantage shown in this study is the application of practicum learning for teachers to make the most of their time to obtain reinforcement of the psychomotor abilities of students through more in-depth interviews. The application of qualitative research in this study uses Nvivo software to assist teachers to conclude data and linking data from one data to another.

Nvivo software is a category of computer-assisted qualitative data analysis software (CAQDAS) that has several capabilities so that researchers can link items, code, perform queries, annotate, and map research data (Sidik and Mulya, 2011). The use of Nvivo by qualitative researchers in addition to assessing students' abilities is also supported by Walsh (2003) who says that data analysis operates like maps in qualitative data so that researchers accustomed to using manual methods in qualitative data analysis will not feel strange to the Nvivo software.

4. CONCLUSION

The psychomotor abilities possessed by students in XI MIPA 5 class with different levels in each aspect included the moving aspect, which had three sub-indicators with a conclusion percentage of 95.8%, the manipulating aspect, which had six sub-indicators with a conclusion percentage was 95.8%, the communicating aspect had five sub-indicators with a percentage conclusion of 91.2% and the creating aspect had two sub-indicators with a percentage conclusion of 65.6%. Moreover, the location of the student's difficulties in the overall sub-indicators regarding psychomotor abilities include skills in measuring solution volume, measuring solution temperature, listening to opinions from other groups, analyzing problems that occur, and compiling a practicum report as a whole. Thus, it can be concluded that of the four aspects of psychomotor abilities observed, the moving aspect appears to be the most dominant among others.

REFERENCES

Agus, D. 2018. Penilaian Psikomotor. Depok: Karima.

Andi, N. 2014. Penilaian Ranah Psikomotorik Siswa Dalam Pelajaran Bahasa. Edukasia : Jurnal Penelitian Pendidikan Islam. 9(2): 385-400.

Apko, H. 2015. Peningkatan Keterampilan Siswa Berdiskusi Kelompok Melalui Penerapan Pembelajaran Kooperatif Tipe Jigsaw Pada Materi Sistem Koordinasi di SMP N 2 Bubon. Prosiding Seminar Nasional Biotik. Aceh 30 April 2015.

Conny, S. 1992. Pendekatan keterampilan Proses. Jakarta: Grasindo.

Dedi, R. 2020. Konsep Penelitian Kualitatif Plus Tutorial NVivo. Bogor. PT Filda Fikrindo.

Drisko, J. W., & Maschi, T. 2016. Content Analysis. New York: Oxford University Press.

Elly, H., Indrawati, R., & Noeraida. 2009. Penilaian Hasil Belajar Untuk Guru SMP. Jakarta: PPPPTK IPA.

Emda, A. 2014. Penerapan Model Pembelajaran Kooperatif Tipe TPS di SMA Negeri 12 Banda Aceh. Lantanida Journal. 2 (1): 68-79.

Hana, L., Ima, R., Ridwan, S., & Hadi, D. 2021. Implementation of Blended Learning with A STEM Approach to Improve Student Scientific Literacy Skills During the Covid-19 Pandemic. Jurnal Penelitian Pendidikan IPA. 7(2): 224-231.

Hendriyan. 2013. Analisis Kemampuan Psikomotorik Siswa pada Pembelajaran Hands on Teknik Challenge Exploration Activity. Skripsi. Jakarta: Program sarjana UIN Syarif Hidayatullah.

Hernawati, D., & Amin, M. 2017. Analisis Self Efficacy Mahasiswa Melalui Kemampuan Presentasi di Kelas. Education and Human Development Journal. 2 (1): 26-33.

Indah, C. 2020. Profil Kemampuan Psikomotorik Peserta Didik Pada Konsep Sistem Pernapasan dalam Pembelajaran Berbasis Praktikum. Skripsi. Jakarta: UIN Syarif Hidayatullah.

Indrawan, I., Safita, R., & Novalyan. 2020. Manajemen Laboratorium Pendidikan. Pasuruan: CV Penerbit Qiara Media.

Ita, 2021. Profil Kerjasama Mahasiswa Dalam Kegiatan Praktikum. Journal Pedagogi Hayati. 5 (2): 62-68.

Jarot, S. 2020. Literature Review. Diunduh di http://mmsi.binus.ac.id/ tanggal 31 Maret 2022.

Jayanti, H, W., Sartika, R., & Kurniawan, R. 2016. Analisis Kemampuan Psikomotorik Mahasiswa Semester III Program Studi Pendidikan Kimia Universitas Muhammadiyah Pontianak. Ar-razi Jurnal Ilmiah. 4 (2): 62-72.

Lilis, K. 2015. Pengaruh Penerapan Metode Pembelajaran Praktikum Terhadap Keterampilan Berpikir Kritis Matematika Siswa Kelas VIII SMP N 3 Sumber Kabupaten Cirebon. Skripsi. Cirebon: Program sarjana IAIN Syekh Nurjati.

Linggasari, M., Suzanti, F., & Pertiwi, S. 2021. Penguatan Keterampilan Proses Sains Siswa SMA Melalui Video tutorial Praktikum Lapangan. Prosiding Seminar Nasional VI Pendidikan Biologi. Malang 6 November 2021.

Maria, J., Michelle, L., & Jacqueline, L. 2008. The Use of Simulation as A Teaching and Learning Approach to Support Practice Learning. Nurse Education in Practice. 8 (1): 5-8.

Nani, D. 2004. Pertumbuhan Aspek Psikomotorik dalam Pembelajaran Fisika Berbasis Observasi Gejala Fisis Pada Siswa SMP. Jurnal Pendidikan Inovatif. 1 (2): 1-5.

Putri, M., Husna, A., & Ira, L. 2018. Deskripsi Pengetahuan Alat Praktikum Kimia dan Kemampuan Psikomotorik Siswa MAN 1 Pontianak. Jurnal Pendidikan dan Pembelajaran. 7(7): 1-13

Sakti, I. 2011. Korelasi Pengetahuan Alat Praktikum Fisika dengan Kemampuan Psikomotorik Siswa di SMA Negeri 2 Kota Bengkulu. Journal Exacta. 9 (1): 67-76.

Sapiruddin., Novianti, A., & Kertanah. 2021. Edukasi dan Pendampingan Praktikum Fisika pada Siswa SMAN 1 Suralaga Kecamatan Suralaga. Jurnal Pengabdian Masyarakat Berkemajuan. 5(1): 738-742.

Setiyana. 2020. Modul Pembelajaran SMA Kimia Kelas XI. Magelang: Direktorat SMA PAUD DIKDAS dan DIKMEN.

Sidik, A., & Mulya, B. 2011. Pendekatan Analisis Data Menggunakan Nvivo-Software untuk Penelitian Desain Logo Museum Nasional Jakarta. Jurnal Desain Komunikasi Visual Nirmana. 13(1): 1-4.

Siska, M., Muhibbuddin., & Cut Nurmaliah. 2014. Penerapan Pembelajaran Berbasis Praktikum Untuk Peningkatan Kemampuan Kognitif dan Psikomotorik Pada Perkuliahan Anatomi Tumbuhan. Jurnal Biologi Edukasi Edisi 12. 6 (6): 1-8.

Situmorang, L. 2018. Penelitian Tentang Kemampuan Menyimak Siswa Kelas IV SD Negeri 068003 Perumnas Simalingkar Medan Tahun Ajaran 2018/2019. Skripsi. Medan: Program Sarjana Universitas Quality.

Sofyan, A. 2006. Evaluasi Pembelajarn IPA Berbasis Kompetensi. Jakarta: UIN Jakarta Press.

Sudaryono. 2012. Dasar-Dasar Evaluasi Pembelajaran (Pertama). Yogyakarta: Graha Ilmu.

Susilo, W., Kusumaningsih, C., & Aima, H. 2014. Riset Kualitatif dan Aplikasi Penelitian Ilmu Keperawatan (Analisis Data dengan Pendekatan Fenomenologi, Colaizzi dan Perangkat Lunak N Vivo). Jakarta: Trans Info Medika.

Trowbridge, L., Bybee, R., & Sund, R. 1981. Becoming a Secondary School Science Teacher, Third Edition. Columbus, Ohio: A Bell & Howell Company.

Walsh, M. 2003. Teaching Qualitative Analysis Using QSR NVivo. The Qualitative Report. 8 (2): 251-256

Wicaksana, A. 2015. Peningkatan Psikomotorik dan Motivasi Belajar Siswa SMK Kompetensi Keahlian Elektronika Industri dalam Memahami Konsep Teknik Kerja Bengkel Menggunakan Media Pembelajaran Video Tutorial Di SMK N 2 Pengasih. Skripsi. Yogyakarta: Program sarjana Universitas Negeri Yogyakarta.

Winarti, T., & Nurhayati, S. 2014. Pembelajaran Praktikum Berorientasi Proyek untuk Meningkatkan Keterampilan Proses Sains dan Pemahaman Konsep. Jurnal Inovasi Pendidikan Kimia. 8(2): 1409-1419.

Winda, S. 2010. Analisis Keterampilan Proses Sains Siswa Melalui Pendekatan Inkuiri Pada Konsep Sistem Koloid. Skripsi. Jakarta: Program sarjana UIN Syarif Hidayatullah.

Zuni, M., & Prasetiyo, N. 2016. Penerapan Metode Diskusi-Presentasi Dipadu Analisis Kritis Artikel melalui Lesson Study untuk Meningkatkan Pemahaman Konsep, Kemampuan Berpikir Kritis, dan Komunikasi. Jurnal BIOEDUKATIKA. 4(1): 11-14.