IOSR Journal Of Humanities And Social Science (IOSR-JHSS)
Volume 24, Issue 7, Ser. 8 (July. 2019) 01-10
e-ISSN: 2279-0837, p-ISSN: 2279-0845.
www.iosrjournals.org

Profile of Physics Science Process Skills in Experimental Physics Courses

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Abstract: This research is a qualitative research which describes the Skills of Physics Science Processes in Implementing Experimental Physics Practicum.This study describes the Science Process Skills of Physics Students in Conducting Experimental Physics Experiments. From the results of the study as a whole provide the profile or characteristics of the two students observed about the procedure and how to conduct experimental physics experiments. and both of them have profiles that are different from each other, one student quickly adapts to the laboratory environment, there are also unique characters with high curiosity.

Keywords: Profile, Science Process Skills, Experimental Physics.

Date of Submission: 15-07-2019 Date of acceptance: 30-07-2019

I. INTRODUCTION

I.1 Background

The experimental method is a way of presenting lessons using experiments. By conducting experiments students will be more confident about things learned rather than just accepting theories from lecturers or books, can enrich experiences, develop scientific attitudes, and learning outcomes will last longer in student memory.

This method is most appropriate when used to realize learning with an inquiry approach or discovery approach. Physics practice plays an important role in educational activities and teaching physics. As written by *"... science is not really science unless it is accompanied by experiment-ation and laboratory work."*.Science is not essential science without experiments and laboratory work (practicum) (Sund & Trowbridge, 1973, p. 183).

The laboratory has become a vehicle for learning how to learn (James, (James, 2006, p. 3); (Amalathas, 2010, p. 9) and (Wirth, 2008, p. 3) in addition to this according to (Taufiq & Wiyono , 2008/2009, p. 643), the science skills obtained from the learning process begin with observations about natural phenomena 1).observation (direct or indirect), 2). awareness of scale (sense of scale), 3). symbolic language, 4).logical self-consistency framework, 5).logic inference, 6).the law of causality, 7).mathematical modeling, and 8).build concepts.

According to Blosser (2000), the process of learning science tends to emphasize giving direct experience to develop competencies and foster thinking skills. The formation of scientific attitudes as demonstrated by science scientists can be developed through science process skills. So that science process skills can be used as approaches to learning. According to Dahar (1988, p. 11), science process skills (SPS) is the ability of students to apply scientific methods in understanding, developing and discovering science. SPS is very important for every student as a provision to use scientific methods in developing science and is expected to gain new knowledge or develop the knowledge they already have. Doing experiments in science requires tools and materials. The success of an experiment or experiment often depends on the ability to choose and use the right tools effectively. The experience of using tools and materials is a concrete experience that children need to accept new ideas. It is not expected, that the tools used are laboratory equipment that must be purchased, simply use simple tools that can be made by the teacher, and existing materials. Surrounding nature is a laboratory that is unexpected in Warren's value (Dahar R., 1995, p. 104)

Science Process Skills (SPS) are skills that are the main reference for students to do scientific work when conducting practical work in a laboratory or in a certain place structurally according to criteria in the model of science process skills. The science process skills are the ability to use the mind, reason, and actions efficiently and effectively to achieve certain results, including the creativity of scientific work when conducting practical work in a laboratory or a particular place.

Students who are practicing or following SPS procedures accordingly classify science process skills

into two parts, namely basic process skills and integrated process skills (Integrated Processes). The basic process skills consist of: 1). Observation, 2). Use of numbers, 3). Classification, 4.) Measure-ment, 5). Communication, 6). Forecasting, 7).. Inferential. While integrated skills consist of: 1). Variable control, 2). Use of numbers, 3). Formula-tion of hypotheses, 4). Operational definition, 5).. Do experiments. Abruscato (Khaeruddin & Eko, 2005). Students must have skills, so they must practice to carry out activities related to those skills. So by looking at the various studies that people have done on the mindset and weaknesses above, the authors propose qualitative research that aims to collaborate between the mindset with student science process skills, which aims to describe the profile of student conditions that will be observed in qualitative research

The brief description of qualitative research with a combination of mindset and science process skills are: a). Observing the condition of students before and until completing practicum using the principle of PPP (science process diligence), both basic SPS and integrated SPS, b). evaluate the performance and work results of students using the principle of mindset, c). observe the influence experienced by students using the principle of mindset, d). do an evaluation to make a conclusion that will eventually provide a profile of the mindset of science process skills from students and the profile of Unesa's FMIPA physics laboratory activity.

This research is divided into four stages, namely: The first stage, is a preliminary study in the form of literature studies, observation and interviews of several lecturers, students and administrative staff, the second stage, which is focused on compiling proposals, third stage, the stage of field work which is essentially data collection and the process of identifying and processing data, and the fourth stage, is data processing and the making of a dissertation.

From the prelimanary study obtained information about the Faculty of Mathematics and Natural Sciences in General and Physics Depart-ment FMIPA Unesa Specifically, namely: Profile of the Department of Physics Unesa, and the most important is information about students who will conduct experimental physics lectures. Lectures on Experimental Physics in Physics Department Unesa FMIPA have weaknesses, namely: face to face lectures are not conducted, do not have practicum guides only have assistants, then students have difficulty in making projects and experimental physics reports that are being worked on, the difficulty of these difficulties is search tools and materials, stages of implementation, data retrieval and theoretical writing from experiments and report forms.

Starting from the above process, the author conducted this study which aims to provide descri-ptive performance appraisal and see the skills of Unesa physics students, also useful to provide solutions to the obstacles faced by physics students of FMIPA Unesal, while doing / following experimental physics lectures.

This research plan will be divided into 4 stages, namely: 1). preliminary 2). proposal making, 3). data collection is divided into observations, interviews and documentation here also made an assessment of student experimental reports in the form of performance, presentations and reporting models, 4). data processing that includes data results, analysis of hypothesis data, conclusions and suggestions.

I.2 Research problems

The main problem in this research is "What are the science process skills of Unesa FMIPA physics students?". This research was conducted to find answers to research problems by sorting them into sub-problems as follows:

1) How is the development of science process skills possessed by physics students of FMIPA Unesa, while participating in experimental physics lectures?
2) How does the development of student science skills affect the process of laboratory learning?

I.3 Research Objectives

There are 2 objectives in this study, namely:

1) Describe and analyze science process skills of physics students in experimental physics learning.
2) Describe and recommend some solutions to the obstacles faced by students who take experimental physics lectures for the next generation.

II. RESEARCH METHODS

II.1 Research Approach

The research approach used in this study is qualitative research. Moleong (2007, p. 4). Defining qualitative methodology as a research procedure that produces descriptive data in the form of written or oral words from people and observable behavior. This approach is directed at the background of the individual holistically (intact). So in this case it is not permissible to isolate individuals or organi-zations into variables or hypotheses, but need to view them as part of a whole.

According to Prabowo (2011: 4) qualitative research is observing people in the environment, interacting with them and interpreting their opinions about the surrounding world, then Sukmadinata (2011, p. 60), states that qualitative research is a study aimed at describe and analyze phenomena, events, social activities, attitudes, beliefs, perceptions, thoughts of individuals or groups.

II.2 Research Subjects

Informants or informants are people who can provide the main information needed in this study. Prastowo (2011). In social survey research, the subject of this research is humans while in experimental psychology studies it is often used by animals as subjects, in addition to humans. The process of carrying out experiments, animals or humans as the subject of this study there are those who actively participate and those who participate only passively. (Azwar, 2011).

The data source in this research will be using the "purpose sampling" technique. Sukmadinata (2011, p. 101) states that the purposive sample is the sample chosen because it is indeed a source and is rich in information about the phenomena to be assessed. This sampling is based on the choice of the researcher about what aspects and who are the focus at the time of a particular situation and on the purpose of the focus of this study, continuously throughout the research.

In this study, the subjects were the 4 Physics semister students of Unesa Faculty of Mathematics and Natural Sciences. The selection of 4 Physics semister students from FMIPA Unesa was the subject of the study because of the lack of research on the practice of thinking patterns in science process skills in the world of education, especially the 4 physics semister students of Unesa FMIPA.

Researchers determine the subject of research based on the problems that will be examined about the mindset of science process skills of physics students in conducting experimental physics prac-ticum. So, the subject of his research was the student of physics department FMIPA Unesa, who was active and took part in experimental physics lectures. In this case the researcher determines the main subject in this study amounted to 1 person first, if it is considered that the information provided is still lacking, it will be developed into 2, 3 and so on until the data is in accordance with the research theme, or data from each student is the same as before.
Researchers as supporting subjects in comparing and equating data and information obtained from the subject or main respondent, namely physics students who are doing practicum. The selection of research subjects or respondents based on people who are considered to know best and on certain considerations has information needed by researchers. hence, the reason for taking some physics students as research subjects is based on the fact that the physics students are considered to be able to provide as much information. The research subjects of some physics students are expected to be able to reveal complete and detailed information and data about the mindset of science process skills.

II.3 Research Steps

In this study, so that the implementation is directed and systematic, the stages of the research phase are arranged. According to Nasution (in Prabowo 2011) there are four stages in conducting research, namely as follows:

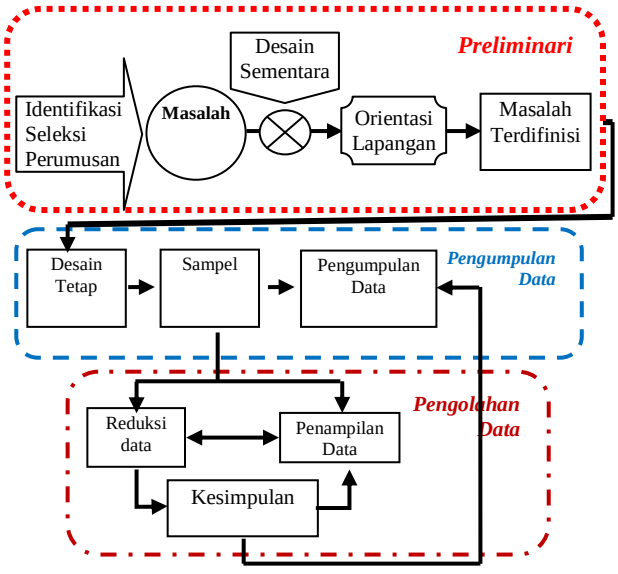

Fig.1: Stages of Research (Source: Prabowo, 2011)

II.3.1 Phase preliminary study

The Preliminary Study phase was conducted by researchers during February 2016. The researcher conducted a preliminary survey by looking for the subject as a resource. During this survey process researchers conducted a field study (field study) against the background of the researchers also taking efforts. scientific confir-mation through literature searches of research books and references, looking for data and information

about student life. research support. At this stage the researcher prepares a research design which includes an outline of the research methods used in conducting the research.

II.3.2 Stage of field work

In this case the researcher enters and under-stands the research setting in order to collect data. This stage is carried out during the even semester of 2016.

II.3.3 Data analysis phase

The third stage in this study is data analysis. Researchers in this stage conduct a series of qualitative data analysis processes up to the interpretation of data data that has been obtained previously. In addition, researchers also took the data triangulation process that was compared with the theory of literature.

II.4.1 Evaluation and reporting phase

At this stage the researcher seeks to consult with Promotro / Guidance on predetermined data.

II.5. Data Collection Method

In order to obtain the data needed in this study, the techniques that the researchers will use are as follows:

II.5.1 In-depth Interview (Indepth Interview)

Interviews are conversations with specific intentions. Conversations are conducted by two parties, namely the interviewer (interviewer) who asks questions and interviewers (interviews) who provide answers to the question (Moleong, 2007, p. 186). Interviews are used to establish communi-cation with the subject of research so that the data needed is obtained. This in-depth interview technique is obtained directly from the subject of the study through a series of questions and answers with the parties directly related to the subject matter.

In this study the interview was conducted using a guided free interview guide. Free guided inter-views are ways to ask questions raised freely, meaning that the questions are not fixed on the interview guidelines, the main problem in the research can then be developed according to conditions in the field (Hadi, 1994: 207).

In conducting this interview, the interviewer carries a guideline that only contains an outline of the things that will be asked. Interviews in this study were conducted repeatedly on students, when they had met the saturation point. Semister students 3 and 4 Physics Unesa FMIPA. The interview is considered complete, ie there are no more things to ask. This interview aims to obtain information in depth about self-knowledge, self-assessment and expectations of self.

II.5.2 Observation

According to Burhan (2007: 115) observation is the ability of a person to use his observations through the work of the five senses of the eye and assisted by other senses. In carrying out this observation, the researcher will approach the research subject so that there is familiarity between the researcher and the research subject. This study uses a type of non-participant observation where the researcher does not participate in the activities that the subject does, but observations are made during the interview. Observations made using structured observations, namely by making observations using the observation guidelines at the time the observations were made. This observation was carried out when the subject and the researcher were carrying out the project they made and during the course of the interview.

II.6. Research Instruments

1. The instruments used by researchers in this case are principal instruments and supporting instruments. The main instrument is the researcher himself while the supporting instru-ments are observation guidelines and interview guidelines. The main instrument in this study is the researchers themselves. Researchers as instruments can relate directly to respondents and are able to understand and assess various forms of interaction in the field. According to (Moleong, Lexy, 2007, p. 168).
1. The position of the researcher in qualitative research is that he is also a planner, executor, data collection, analysis, data interpreter, in the end he becomes the reporter of the results of his research.
2. The second instrument in this study is the interview method. In general, the preparation of data collection instruments in the form of interview guidelines is carried out with the following stages:

a. Hold identification of the variables in the formulation of the research title or those listed in the research problem.
b. Describe variables into sub or variable sections.
c. Look for indicators for each sub or variable section.
d. Placing descriptors into instrument items.
e. Complete the instrument with guidelines or instructions and introductory words (Arikunto, 2005, p. 135).

Furthermore, before conducting the interview the researcher first made the interview guideline grid as follows:

3. The third instrument in this study is observation. In general, the preparation of data collection instruments in the form of observations is carried out with the following stages:

a. Hold identification of the variables in the formulation of the research title or those listed in the research problem.
b. Describe variables into sub or variable sections
c. Look for indicators for each sub or variable section.
d. Placing descriptors into instrument items.
e. Complete the instrument with guidelines or instructions and introductory words (Arikunto, 2005, p. 135).

II.7. Test the validity of the data

To test the validity of the data obtained so that it is truly in accordance with the purpose and purpose of the study, the researchers used triangulation techniques. Data triangulation is a technique of checking data that utilizes something else outside the data for checking or comparing data (Moleong, 2007, p. 330).

The triangulation used in this study is triangula-tion with sources and methods, which means comparing and checking the degree of return of trust in information obtained through time and different tools in the qualitative method of Patton in (Moleong, 2007, p. 330). reach by the following way:

Comparing observational data with interview data.

1). Defining results in general theories or concepts with what results from individual interview data.
2). Comparing a person's situation and perspective with various opinions and views of experts in the field being studied.

Another validity test technique used by the researcher is the extension of participation. Accor-ding to Moleong (2007: 327) Extension of partici-pation means that researchers live in the research field until the saturation of data collection is reached. This, the researchers extend or increase the time of the interview and observation of the two subjects so that the data reaches Saturation.

II.8. Data analysis techniques

Data analysis according to Patton (in Moleong, 2007, p. 103) is the process of arranging data sequences, organizing them into a pattern, categorization, and basic unit of description. According to Bogdan and Biklen (in Moleong, 2007, p. 248) data analysis is an effort made by working with data, organizing data, sorting it into manageable units, synthesizing it, finding and finding patterns, finding what is important and what is learned, and decide what can be told to others.Activities in qualitative data analysis are carried out interactively and take place continuously until complete, so the data is saturated. Activities in data analysis, namely data reduction, data display and conclusion drawing / verification. (Miles, M. B. & Huberman, A. M., 1984).

Data reduction, means summarizing, choosing the main things, focusing on the important things, looking for themes and patterns and removing unnecessary ones. Thus the data that has been reduced will provide a clearer picture, and make it easier for researchers to carry out further data collection, and look for it if neede. In this study, the researcher conducted a data reduction by summarizing the data and information that had been obtained from the informants and grouping them based on the issues revealed.

II.8.1. Data display (data presentation). In qualitative research, the presentation of data can be done in the form of brief descriptions, charts, relationships between categories, flowcharts and the like. In this case, Miles and Huberman (1984) in Sugiyono (2007: 341) stated "The most frequent of data display for qualitative research data in the past has been narrative text". The most frequently used for presenting data in qualitative research is narrative text. The researcher presents the data in this study by using a brief description described by the researcher in the form of a narrative and presenting data in the form of tables to facilitate the researcher in analyzing the data obtained.

II.8.2. Conclusion Drawing / verification. The third step in qualitative data analysis according to Miles, M. B. & Huberman, A. M. (1984) is drawing con-clusions and verification.

The initial conclusions put forward are still temporary, and change if no strong evidence is found that supports the next stage of data colle-ction. But if the data conclusions data presented at the initial stage, supported by returning valid and consistent evidence when the researcher returns to the field of collecting data, then the conclusions put forward are conclusions that are credible

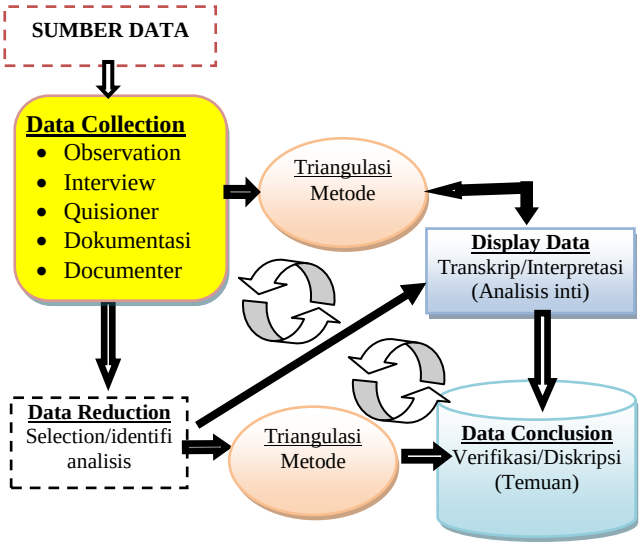

Fig. 2: Modification of the Miles & Huberman model

The conclusions in the expected qualitative research are new findings that have never before existed. Findings can be in the form of a description or description of an object that was previously dim or dark so that after being examined it becomes clear, it can be a casual or interactive relationship, hypothesis or theory.

Drawing conclusions conducted by researchers based on the results of research and data analysis that has been obtained from the field about the role of the trainer in improving learning motivation and independence of street musicians. Conclusions from the results of data analysis that has been obtained, carried out re-checking with the suitability of the data obtained in the field. Re-checking of the data obtained is done by means of an extension technique followed by the participant where the researcher lives in the field of research to obtain as much data as possible. With the extension of participation, recording the data collected can be increased. In addition, researchers also use triangulation where researchers obtain information and data from other sources to strengthen research results. In this case the researcher obtained other information from physics students who did experimental laboratory practicum.

To check the accuracy (correctness / accuracy) in this study, researchers conducted several methods. Checking the validity of the data in this study, the researchers conducted the method according to the opinion of Soenarto (2001: 83) namely Triangulation (feasibility test by cross-checking) with third parties, and Peer-debriefing (feasibility test by means of discussion) with other Japanese language instructors to measure data qualifications, methods and results of analysis. Checking the validity of the results of this Student SPS study, is very important, therefore the truth and accuracy of the data obtained need to be known. This is in accordance with the opinion of Lincoln, Y. S., & Guba, E. G. (1985, p. 83), the SPS student research also uses the theory of Qualitative Validity with indicators: 1). credibility (trustworthiness), 2). Transferability, 3). Dependa-bility, and 4). Confimability.

III. RESULTS AND ANALYSIS

III.1 Results of observations and interviews

III.1.1 A001 Subject

Table 1: Validity of the Skills of the Process Process possessed by A001 Subjects Rec. 0015, Subject

NO	Observation	Interview	Data Validity Through the Triangulation Method
08-11-2016 siang hari Subject A001 dan Subject B00!	B001 subject gives a rope, on both sides in the middle of the rope there is a roller at the corner, the subject then covers the mass, alternating from 1 gram, 2 gram, 5 gram to 10 gram, friction is the gravitational force so that it will be seen that a mass. there are two masses at the end, the other mass is above and the second mass is hung and pulled by gravity without any friction force so the calculation will be without friction. In the beginning of the video, it appeared that Ko-as seemed to help repaint the device used to connect to the computer and had to use a blower. You can repeat each mass 10 times, so if the blower is turned on rather noisy, the mass movement m1 is very fast, so one person must monitor the computer, another that instructs to release the mass m1, sometimes it is difficult to set the distance of the object the beginning of the mass m1 until the last certain length of mass m1 end.	prepare the mass from 1 gram, 2 gram, 5 gram to 10 gram, as mass 2 (m2) and mass 1 (m1) continue to set the photo beginning and end, try setting the blower as well as the computer settings well, we try the corner and the location of the fall of the marble at that point, we give the carbon that the opaque facing up on the carbon, we give the white paper so it looks the former fall of the marble, we put up to 5 pairs of paper and carbon because sometimes the march deviates from the first point, we measure each of the falling marble points from the launcher for the distance x	There is validity of the data through triangulation of methods for parts, mass of 1 gram, 2g ram, 5 grams to 10 grams given will be linked there, Category (SPS-3) There is validity of data through triangulation of methods for parts, determination of distance is rather difficult to mean memuli 0 from where, because 0 must be measured until where the last mass m1 is in the category SPS-4

III.1.2 Rec. 0015, A001 Subject

NO	Observation	Interview	Data Validity Through the Triangulation Method
08-11-2016 siang hari Subject A001 dan Subject B001	Researchers take up to 6 data from both subjects because many fail, failing because they require fast dexterity, including instructions from monitoring the computer with the one who placed the m1. there are 6 videos that the researcher got, the subject did the experiment, each video was 19 minutes, minutes. Projetif launcher (pelontar tube that will produce bullet motion or half parabolic motion. The difficulty of observing the subject is to put the starting point where the marbles fall, the subject must use some paper and carbon to put the fall point, because sometimes the throws from the projectile are deviated, sometimes up to 5-6 carbon papers above and a white paper below to see the falling point of the marbles. then note how far it is,	in the throwing tube there are 2 photogates which are used to find out the Vo marbles that are ejected from the tube, the angle of the tube must also be counted, now we try the corners and the location of the falling marbles at the point we give carbon that the opaque facing up on the carbon we give white paper so it looks the former fall of the marbles, we attach up to 5 pairs of paper and carbon because sometimes the marbles deviate from the first point, each point falls we measure from the pole to distance x it	There is validity of the data through the manipulation of the method for the part, the difficulty of the subject is knowing the starting point where the marbles fall, the subject must use some paper and carbon to see the fall point of the Category marbles (SPS-7). The validity of the data is through the tri-angulation of methods for the part because it sometimes deviates from the projectiles, up to 5-6 papers and carbon, then records how far the distance is, Category (SPS-1 and 7)

III.2 Results of interviews and observations, as well as documentation.

III.2.1 Rec. 0012, B001 Subject

Table 2: Validity experience proces science of subject

NO	Observation	Interview	Data Validity Through the Triangulation Method
Observation Data tgl serta 30-11-2016dan 01/ 02-12-2016	The B002 subject conducts motion experiments for slopes for marbles with the photo-gate sensor the results can be seen on a computer, this is done by 2 people, one is watching the monitor and the other is setting the marbles so that the trajectory does not hit the edges of the field because it will cause friction. After they submitted a report to the lecturer it turned out that the calculation was not in accordance with the theory, After I asked the subject B002, it turned out that there was a delay time photographed, the photos were too high so the data was not suitable With theory Some suggest trying to use the cellphone timer, and others also suggest using a manual stopwatch (needle)	first explained by ko-asi, then we were told to try it ourselves. . . . there are still many more, the distance between the photos is tried again, the marbles are still shaking left and right, the slide bench is adjusted again, it must be adjusted to the command from the friend who holds the computer's mouse. I count it manually because what the lecturer asks is temporary data complete with calculations do not use photo-gate, it also uses a stopwatch, I also try to use the timer, the cellphone turns out to use a stopwatch because our hand riflex is a better stopwatch than the cellphone.	first explained by ko-asi, then we were just told to try it yourself Category (SPS-2) This was done by 2 people, one watching the monitor and the other arranging the marble ball so that the trajectory would not hit the edge of the field because it would cause friction, Category (SPS-4). they make and submit a report to the lecturer, it turns out the calculation is not in accordance with the category theory (SPS-4) there is a delay time being copied, the photos are too high so they don't match the distance after counting, Category (SPS-4)

III.2.2 Rec. 0012, Subject B002

NO	Observation	Interview	Data Validity Through the Triangulation Method
Observation Data Subject B001 dan 002 tgl 02-12-2016, dan 1-12-2016 serta 30-11-2016	After they tried, both of them turned out, even though they were used to using the cellphone, it was still much better to use a needle stopwatch (different from a digital stopwatch) where our reflexes against stars and stops were only a few minutes, what slope it is difficult to determine because it must be arranged how so that the ball is in the middle of the track without turning because if another turn the calculation, and if it rubs against the wall beside it also there will be friction later not fulfilling because there is friction there after they recorded everything then compared with the manual stopwatch using the photo-gate, and the results that could be received were those who used a regular stopwatch, depending on our sensitivity to use the stpwatch. What makes the duration of this experiment actually is regulating the path, marking the angle, adjusting the angle, where the marbles rolling do not tilt because they have to be right in the middle to the end, because they can be timed with the stopwatch. After being reported and finally received after several repetitions	the way is just don't use the computer anymore, I don't use photo-gate, it also uses a stopwatch, I also try to use the timer, the cellphone turns out to use a stopwatch because the riflex of our hand is better than the cellphone When retrieving the data, don't let the marbles knock on the launcher's wall, having to stand in the middle is rather difficult, if the data is broken, it won't be used ... . by co-as it was ordered 25 times each corner, I was told to change the angle 5 times, wow it was in accordance with the time also 2 hours new selselai the data is just to copy using the excel flashdisk again and if I count it manually because what the teacher asks is temporary data complete with calculations	even though they are used to using the cellphone, it is still much better to use a needle stopwatch (different from a digital stopwatch) where our reflex power is against the movement of marbles (stars and stops), the delay is only a few minutes, Category (SPS-1 and SPS - 4). The validity of the data through the triangulation method for the hard-to-determine part because it must be arranged so that the ball is in the middle of the track without twisting, and if it rubs against the side wall, because there will be friction in the SPS-3 category. There is validity of the data through the tri-angulation method for the part after they have recorded it all, then compared the normal stopwatch and the photo-gate results, and what is acceptable is the normal stopwatch data, depending on the sensitivity we use the stop-watch. Categories of SPS-5 and SPS-7

IV. CONCLUSION AND SUGGESTIONS

IV.1 Conclusion

The research conducted has revealed the mindset of the skill of the science process possessed by students in carrying out experimental physics, in this study began with the assessment of the gradual accuracy of the scientific process, then revealed the background patterns of thought possessed, based on various findings obtained in this research are as follows:

a) Profile of students in conducting experiments as follows: 1). Making mistakes include: not carrying a guide, taking notes, relying too much on a cellphone, and hoping too much for help from ko-as, 2). The time used when conducting experiments is lacking, because the data must be taken a lot. 3). This experimental procedure was done incorrectly due to the lack of guidance they held. 4). Students must repeat the experiment because some experimental equipment is not in accordance with the exact conditions. 5). some experiments when used are dangerous and noisy or noisy.

b) Profile of the impact of student SPS development on the laboratory learning process is: 1). Supreme students have brought the necessary notes and read the guides on the cellphone, and used appropriate tools, 2). Working in group reports, sometimes students work on their own boarding, but most work on reports in the joint campus, 3). Do experiments quickly and quite well because they have done it before, d). Have done together and helped each other experimentally, 4). Students with a background in interest in a particular subject run out of results whose experiments are not very good.

So from all the physical lecture processes experiments can be concluded that: "As a result of the background of the mindset that is owned and the lack of knowledge about science process skills, it requires students to do several times in carrying out experimental physics, which affects the results expected to be seen only after students have conducted experiments two or three times".

IV.2 Suggestion

The suggestions for several experiments conducted in experimental physics laboratories are:

a. Experimental guide

The worksheet or experiment guide must be in printed form, because if it is in the form of a pdf file, it cannot be opened at the time of the experiment, the guide is left in accordance with the original so that students begin the study with English literature, the guide has fulfilled the requirements as guide,

b. Thermal expansion experiment

The far-reaching thermal expansion experiment table had to pass two other experimental tables, it should be between the experimental table and the metal refrigerator that would be used in the experiment, because in addition to the metal used when pushed and carried over two experimental tables Other times the temperature will quickly rise to room temperature.

c. Projectile launcher experiment.

The projectile launcher's experiments need to get special attention, among them is the noise that is issued by the launcher of the marbles as well as the sound of the marble being thrown, also must be given a wall partition of agara marbles which are not thrown on other practices, nor on the glass cabinet. The manual has been warned to seal protective glasses, but as long as the researcher observes no one uses them.

d. Fotogate Experiment

It seems that this photogate experiment is designed not for marble objects, but objects larger than marbles, maybe the object used is a golf ball, because the photo pole is too high for marbles, and it is evident that the data obtained by students is incorrect, after students learn Regardless of this experiment and not using fotogate but using a stopwatch, the results obtained are close to the theory.

e. Air Truck Experiments.

According to observations by experimental researchers, it is quite difficult to regulate the movement of mass that is fast enough, the mass of m2 should not be more than 5 grams, because of the very fast movement due to blowing blower.

f. f. Co-As (or Co-As-Lab).

Some Co-As can be seen in the observation video helping students when collecting data, this does not provide opportunities for students to develop their thinking.

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