

Reflection of The Chemistry Practical Work Activity in The Undergraduate Degree's Study Program of Public Health STIKES Dharma Husada Bandung

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Abstract: *Chemistry was the study field that is examined the empirical facts in the nature, so it is needed an assessment in the laboratory that is designed as a miniature of the universe to learn it. This study is conducted to determine the result reflection of chemistry practical work activity of undergraduate degree's students of Public Health STIKES Dharma Husada Bandung. Therefore, the students of undergraduate degree's study program of Public Health have the diverse of educational backgrounds, many of them who came from the non-science, so it is deemed necessary to know a more real chemistry, in order to be more easily to accept, namely through the practical work. The results used to determine the strategy and method in guiding a practical work, so that it would be obtained the optimal learning result. The method used were a survey, using a rubric and questionnaire. The model design of its research was an observational description, to see a reflection of the student's chemistry practical work activity. The number of samples were 31 people. The result showed that the students are liked to the practical work's activity and became more interested in their interest to learn chemistry. The positive research results indicated that the practical work was an important to be implemented for the students university, especially for the participant with the non-science educational background, in order they can to know the chemistry easily. The weakness in this practical work such as; the limitation of the laboratory facilities, namely completeness of the laboratory room, such as the less of exhaust fan and acid case, the practical work's equipments are also limited, so the students should be in group and to returns to using it, whereas the students have already excited to follow the practical work. The result of this study is needed to be further developed, by developing the strategy and the practical method that can be overcome the weaknesses that found.*

Keywords: reflection, practical work, chemistry, introducing, non-science

1. Introduction

The practical work activity is an important activity in the chemistry learning that is examined the empirical facts, that is existed in the nature, so so it is needed an assessment in the laboratory that is designed as a miniature of the universe to learn it. The laboratory activities was a medium to develop and implement the science process skill, arousing the learning interest and providing the evidences for the theory or concepts that have learned by the students, so the theory or those concepts were becoming more significant, on the student's cognitive structure.

Research on the chemistry learning and science, since previous time have been a lot done, but the research about chemistry practical work at the College of Health Sciences (STIKes) is still rare, although there were still a lot of rejection / dislike from the students of STIKes itself, against the chemical material that have not been handled still, they have a hunch still that the chemistry is not related to its field. In fact on the field, the employee of health who will become an profession of STIKes' alumni, often related to the chemistry, such as helping people with the poisoning, without having the chemical competence, they will not understand the function of the dilution (giving much drink to the patient) or neutralization (giving drink milk to the sufferer). So that, it is needed to do a approaching to more introduce of chemical that related to the health to students of STIKes, through the chemistry practical

work. The research that have been done is an approach ways of chemical learning to the student's prospective of health employee, by using of poster which is then obtained a change of student's attitude, towarded the chemistry learning, from rejecting, to be receiving (Nancy El-Faragy, 2009).

According to Johnstone (in Nancy El-Faragy, 2009), a chemical is often considered as difficult to be learn. Then Osborne et al. (in Nancy El-Faragy 2009) stated that a partly of people (especially with the educational background that directly not-related to the chemistry) to see a chemistry as an abstract and bored, and only those who are intelligent academically can learn this subject. Daly and Eddy (in Nancy El-Faragy, 2009) said that, it seems here that is important was the curriculum that should be able to reflect the needs of students, that was useful for their future careers, as well as to develop the critical thinking and the problem solving skill that related to the career. From the explanation above, it is appeared that the chemistry practical work was important to be implement, to support the learning in the classroom, so that the chemistry can be learnt evidently, and it is not boring, for the next it is expected the learning outcome was better.

The students of chemistry practical work's participant in the undergraduate degree's study program of Public Health STIKes DHB, a partly is derived from non-science majors (IPS, SMK, Religious, etc.), For their, the chemistry practical work had never been known previously, because

while in the high school, they have not gotten any chemistry lesson. So that, the chemistry practical work is become very necessary for them. The Practicum is intended to know the chemistry evidently for those who have not familiarized with the chemistry previously, so that it is expected to explore an interest of students in studying chemistry. The practical work is provided the practical learning experience for the students, to support the learning in the classroom. According to Trisha L. Anderson and G. Bodner (2008), to enhance the student's experience and the learning outcome, it is needed to do a learning activity that centered to the students, such as that was held during the practical work.

Perception and attitude that related with the science and learning were important (Laurie Cree and Sandra Rischmiller, 2003), by engaging the students in learning, in order to be more active, hopefully they can develop their own ability and became a better learner. Chemistry practical work can be selected and presented in a way, so it was relevant to their life and profession, as the health professionals. The Practical work was an opportunity to do an activity that included; to see a reality, analyzing, making a decision, and being critical was an important skill to be developed and used in the workplace.

It was important for the teacher to be able to reflect an policy and educational practice that related to the learning and teaching, so it was necessary to do an reflection against a practical work activity in undergraduate degree's study program of Public Health STIKes DHB. This matter is expected to improve a quality of teaching and the learning approach to encourage a learning for the students. According to Kellogg and Kellogg (in Nancy El-Farargy 2009) the teaching, learning, and assessment were interconnected. So, the educators is needed an understanding and adequate knowledge about how the students learnt, in order to develop the teaching, learning and assessment method that effective. Based on the description and background above, it can be formulated that became a question in this study was : How is reflection result in the chemistry practical work activity of Undergraduate Degree's Study Program of Public Health STIKes DHB?

This research has a common objective to find out the reflection result of the Chemistry practical work activity in Undergraduate Degree's Study Program of Public Health STIKes DHB. The specific objective to be achieved in this study, such as: to introduce the chemistry evidently, especially for those who have not ever known it; to determine the readiness of students to participate the practical work, by assigning to make a journal; to determine the student's chemistry competence, by providing the test; to know the skill of students, for the experiment that their held, by observing the way it is worked, to know the student's competence in describing their observation, by assigning them to make a chemistry practical work's report.

This study is expected to provide a benefit, can be a reference for the learning development and became an input for the teaching chemistry evaluation.

2. Research Method

The method used in this study is a survey method, by using a rubric (practicum card) and questionnaire. This study is used aobserational description study model (John W. Creswell, 2008), to see a result reflection of the activity in Undergraduate Degree's Study Program of Public Health STIKes DHB and implementation information of the practical, based on the student's perception.

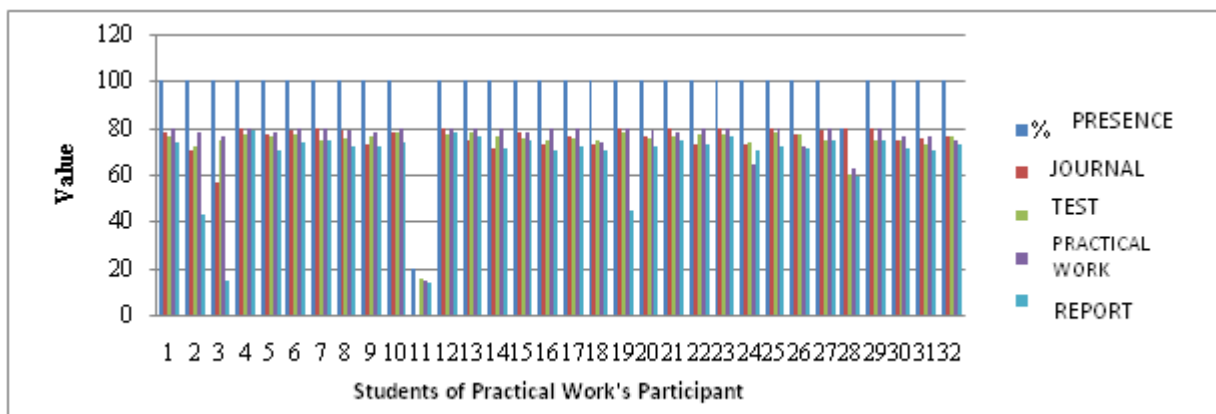
To find out the reflection of chemistry practical work activity, the data is retrieved through the practical work's card for assessment and questionnaire that consisted by five questions, that have been validated by the expert, to be tested to the students as participant in the practicum. The results are processed and presented, so the result of chemistry practical work activity in the Undergraduate Degree's Study Program of Public Health STIKes DHB is described.

In this study, the data were collected through the journal, test, experimental activity, report, attendance list, and a questionnaire from 31 students as the participant in the chemistry practical work. Firstly, the data are processed through the stages; [1] the value of practical work's card of every student that consisting by the values; attendance, journal, test, practical work, and report, to be summed and averaged [2] the all average value of each practical work participant's card is included into a table (master table) [3] for each item is made its graphed, to see the tendency from the class. [4] The practical work's value of each participant is obtained by summing the proportion of; attendance (10%) + journal (20%) + test (15%) + work (25%) + report (30%) [5], the final value of the practical work is obtained by summing the proportions of ; practical work's value (70%) + semester final exam value of Practical work (30%) [6] to facilitate the analysis, it is made a class recapitulation graphed of the practical work's value, that is consisted by a practical work's value (by its comment), the value of semester final exam, and the value of final practical work [7] from the questionnaire, the answer of each student is given a code; the 'yes' answer is coded 1, and the 'no' answer is coded 0. [8] after encoding, then the result is tabulated, and it is conducted the summation [9] The amount of each item, from the questionnaire are made a percentage, following the formula: a number that has been obtained / number of respondents (31) X 100 %, [10] the percentage of the calculation result for every item, then it is tabulated and graphed. Further, it is conducted an analysis of the data, against the processed data's result by the steps; [1] look at any chart, to determine its tendency [2] the observation's result of the rubric (journal assessment, test, practical work, and the report), then it is triangulated (Anas Sudijono 2011) by the observation's result from the questionnaire and the theory that related to the research, it is conducted an analysis and made a conclusion [3] criticising the research's result, what is became a shortcoming and it is made as a suggestion.

3. Results and Discussion

3.1 Observations' Result with the Rubric (Practical work's Card)

Here was a curve of observations' result, with the practical work's card that are included; the presence, making a journal, the test, practical work, and making a report, these following was its discussion.



Graphic 6: The Average Value of Student's Practical work

For the students of chemistry practical work's participant, is required to be present at all practical work's activities, but there was an unwritten tolerance to not follow the one-time practical work. However, there is also the absence was high enough and finally 'drop' from the sample. Overall, the attendance percentage average of the practical work's participant is 97%.

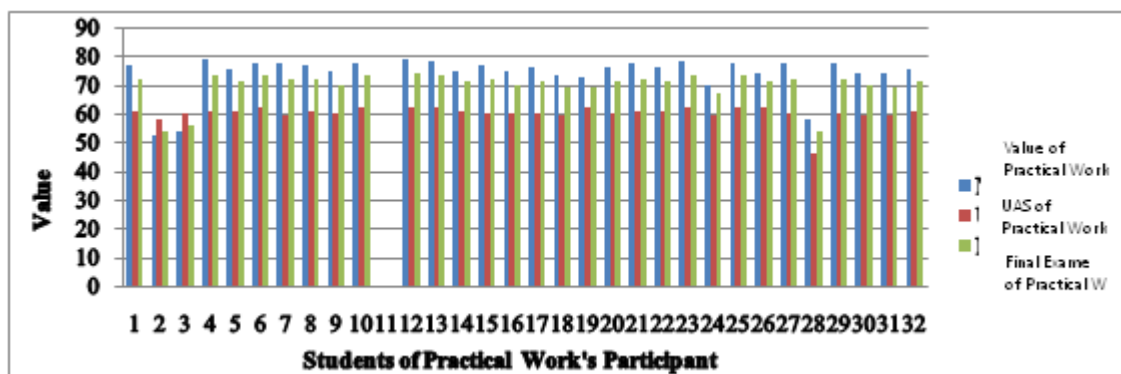
Before following the practical work, the students are assigned to make a journal for the practical work that will be conducted by them. It is intended to prepare the students before doing the practical work, so that they can work well in the time and orderly, because they have known what should be done. All participants of practical work should make a practical work's journal that has been assigned, they are made as able as them, and the overall of practical work journal's average value was 73.8. This value was quite good, considering among of practical work's participant was many of students with the non-science background.

To know the competence of the students of practical work's participant about the practical work's material and how it is worked, so it was necessary to be conducted a measurement by giving a test. The test is conducted once time, in every time of practical work is conducted, it can be at the beginning before of practical work or at the end before the practical work. As for its test's result, can be seen in the graphic above, the whole of its test's value after averaged, the result was 73.4. The results of its test indicated that their chemistry competence average was good enough.

According to the observation's result, the students seemed interested and eager to do a practical work, but it was quite orderly, they are worked as was directing by the assistant. All students worked quite well, so the whole practical work that they done, the average value was 75.6.

The task of making the practical work's report is intended to train the students, in order to be able to describe 'what they have done, analyzing it and making a decision, and then putting it in the writing form of scientific paper, that was in the form of practical work's report, with the rule that appropriate with the applicable rule. It will be a provision for the students when they wrote their thesis. In making the report as a training in order to be able to write a scientific paper, the result was not bad but it still has to be increased again, because the result has not been optimal yet. Overall, the average value in making a report was 67. This matter may be able to be knowledgeable, because they were still new to learn, remember this practical work is conducted in semester 1. The scientific writing ability of them can still be improved, by following the lecture of Research Methodology as a compulsory subject, in the subsequent semester.

Every participant of the practical work, will get any practical work's value. The value would be obtained if the result of all practical work's activities are accumulated by proportions; attendance (10%) + journal (20%) + test (15%) + work (25%) + report (30%). The value of student's practical work can be seen in the recapitulation graphic below:



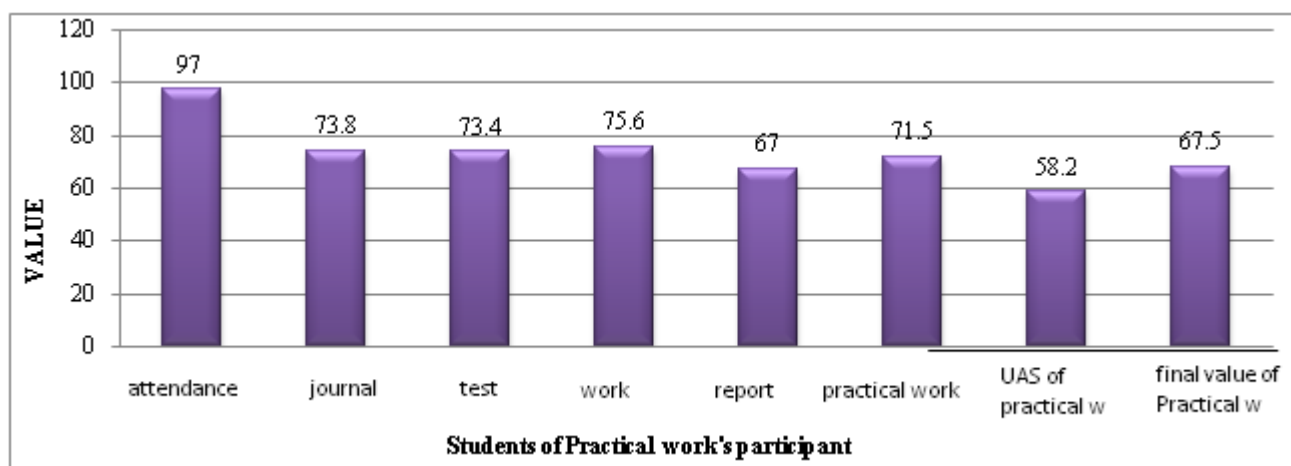
Graphic 10: The Practical Work's Value, UAS of Practical Work and Final Score of Student's Practical Work

It is appeared from the graphic above, that there are some students who got any practical work's value that was not so good, but it was still upper of 50, so it is no needed to remedial if it was still ≥ 50 , as the academic's applicable rule in STIKes DHB. Overall, the average value of practical work was 71.5. This value was still not final, because to get the final value of the practical work, so that the practical work's value will be accumulated with the UAS of Practical work's value. Below was a graphic of the UAS of Practical work's value.

The Semester Final Exam's result of Practical work was still have to be improved, because it have not optimal yet, a largely part was still in under of 60, but it has already above of 55, there was only one person who was still in under of 50. The overall of the average value was 58.2. This not-optimal result may caused by the semester final exam of practical work that is conducted, have just the qualities of a paper and pencil yet, it cannot be implemented in a practice, because there was a limitation, so it might considered to be less attractive and became less in enthusiasm in doing his/her semester final exam. Ideally, the UAS of practical work is conducted in practice too.

The semester final exam of practical work's value have not optimal yet, is implicationed against to the final exam value, because the final practical work's value was an accumulation of the practical work's value and the UAS of practical work's value, by following the proportions of: practical value (70%) + UAS of Practical work's value (30%). From the calculation above, that the majority of the students of practical work's participant are obtained a value above of 60, even there were some students who are obtained the value above of 70, there were also some students who obtained the value below of 60, but it was still above of 50. Overall, the final average value of the the practical work was 67.5. The final average value of this class can be said good still, considering who is conducted the practical work was the prospective of health worker, instead the candidate of chemistry degree. In the field of their future work, they are not required to have the high competence of chemistry practical work.

For detailed of the explanation about its practical work, it is can be summarized on the chart below:



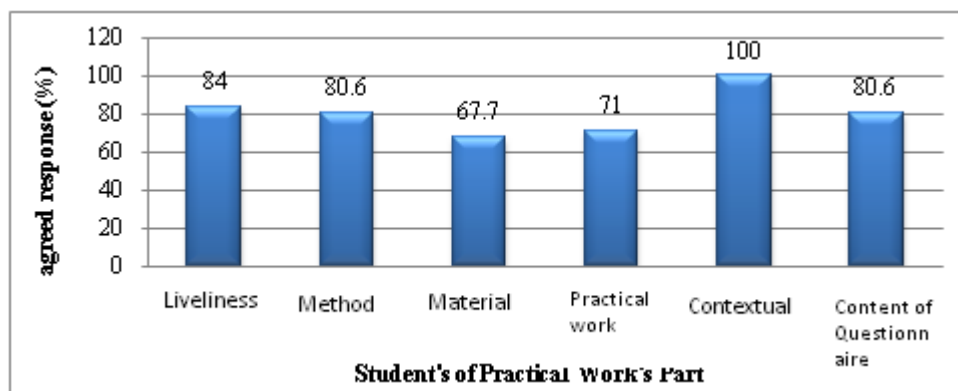
Graphic 12: Summary Value of Practical work's Class

3.1. Observations Result by a Questionnaire

To obtain a valid research result, it is needed to be implemented a triangulation against the data that have been obtained, by a questionnaire and the theory, as well as the other related research. The data results of practical work's activity (attendance value, journal, test, work and report), to

be equipped with a questionnaire that was containing by questions about the learning that addressed to the respondent / sample. The questionnaire that is asked were contained by five (5) questions about; student's liveliness, the method used, the material of practical work, it was important whether or not to conduct the practical work, and the advisability of contextual chemistry learning. The

observation result through the questionnaire can be shown on the chart below:



Graph The Observation's Result with the Questionnaire

From the graphic above, it is appeared that 84% of students (26 people) were actively involved in the practical work, they have a enthusiasm and curiosity during the practical work. Their activeness shown by being attended in the laboratory, have made a practical work's journal, following the test, actively to doing a practical work, making a note and discussing an observation, analyzing and concluding observations, or asking a question that they want to know about its answer. With the highly liveliness of the students in the laboratory, so it is obtained the good result of the study, it can be seen from the number of students who got any good value for the value of journal (the average value of class was 73.8) and the practical work (the average value of the class was 75.6 grade) was much enough, as same direction as the study result of Trisha L. Anderson and George M. Bodner in 2008, that the research of student-centered will be enhanced the learning experience for the students, that will improved their learning outcome. With the existence of student's majority who were active in the laboratory, it is expected can be raised the liveliness of other students who initially less active.

The learning method that is given in the laboratory, has been felt good enough by 80.64% of the students (25 people). It may caused by always strived, in order the atmosphere of laboratory was always conducive, life, and fun. This matter can be demonstrated, by the test's score that was good enough (the average value was 73.4). These effort is should be continued to conduct, even the method can be further developed, so that the whole students can be followed the chemistry practical work by pleasure. As have conducted by Peter Hall and Wynne Evans (2006), who were examined the development of the learning technique, by augment the teaching materials through the web, and the result were the students to be more enthusiastic and satisfied, and it is obtained the exam result that was better.

Most of the students of chemistry practical work's participant, was 67.74% (21 people) who had felt that the chemistry practical work's material can be fulfill the chemistry learning's needs. The students had felt the practical work's material was quite possible, because they are considered that this was a just practical work, or because it was the first time to following the practical work, so that it has not been thought to more demanding against its material. While another some of students, that was 32.26% (10

people) had felt that the material have not sufficient enough yet to fulfill the needs of practical chemistry lecture. This group can be regarded as a critical group, and its number was significant, so that they are needed to be considered, they were not to be ignored, even they can to be a reference for an improvement of the further chemistry practical work's material. According to Daly and Eddy (in Nancy El-Faragy, 2009) that important one was its curriculum should be able to reflect the needs of the students, and it was useful for their future career, as well as to develop the critical thinking and problem solving skill that related to the career.

Most of the students, about 71% (22 people) had felt it is needed the chemistry practical work. With the student's liveliness that good enough in the laboratory, so it should be given an adequate activity, was the presence of the chemistry practical work for the course. This matter is also meant that the most of them have already thought that the practical work will be added their skills in the chemistry material as a preparation for them to carry out their profession in the midst of the future society. According to Dwi Retno Suyanti (2010), the practical work is can be used to support a successful of learning strategy, which is then it would be improved the learning outcome.

The whole students of chemistry practical work's participants about 31 people (100%) have a notion that the course, is included a practical work, it is needed to be collateral with the context in their daily live and their future employment's needs. This is indicated that the chemistry practical work, is needed to be delivered contextually. The research on the chemistry that contextual, has been conducted by Ralf Marks, Stefanie Bertram and Ingo Eilks (2008) with the aim to facilitate the understanding in learning chemistry, and in fact it made a students became motivated and understood, that the chemistry learning has relation with the daily live. This matter was consistent with the existing theory, that the contextual learning can improved the learning outcomes (Nurhadi, Burhan, Gerard, 2004). Most of students of practical work's participant, about 80.6% (25 people) had agreed with the questions that is given to them. This matter will be very helpful for the fluency of the conducting of this further research.

4. Conclusion

The study results showed, that the implementation of practical work can be improving the students' interest to learn about chemistry. The Learning outcomes would be better, if it is supported by the student's activity that are quite high, the method and material of practical work that can be accepted by the students. The chemistry practical work is needed to always be held in every academic year. In addition, the chemistry practical work is needed to be delivered contextually.

The further research is needed to be implemented in the chemistry learning, in order it would be more related to the Bachelor profession of the Public Health and the daily of Public Health's students, so it would be achieved a better learning outcomes, that is by ways to conduct a development of the contextual chemistry lecture.

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