The use of video laboratory report to develop presentation skills in science teacher education students

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Abstract. As the information technology growing so fast, the students in today science classroom is a digital natives student. Science Teacher Education Program in the university is facing the challenges to adapt the situation in order to prepare future science teachers that having the skills to teach those students. The skills for future science teacher are acquired through the pre-service science teacher education program at the university. One of the most important for science teacher's skills is presentation skills using information technology. This study tried to explore the use of video laboratory report to develop pre-service science teacher presentation skills using information technology in Science in Daily Life Course provided by one of the undergraduate teacher education programs. From this study, pre-service science teachers indicated that the use of video in reporting laboratory activity, supported by feedback from the lecturers and YouTube as the media to upload and share their video had enhanced their skills to do laboratory activity presentation in the form of video.

1. Introduction

Education is one area that is very influenced by the advancement of information technology. Information technology is one of the tools in educational process because it allows to create the changes in teaching and learning process including the science learning [1][2]. These changes will occur in line with the development of information technology significantly [3]. It has an impact on improving students' literacy technology [4] and changes the students’ learning experience. The students who have the capability to use technology are known as digital native [4][5].

Digital native is the process of thinking and processing of student information using media with the help of technology [4]. This ability can cause the changes of teaching style so that it affects the teacher's ability to deliver learning materials [6]. The ability of teachers to face digital native students should be prepared as early as possible through teacher education programs [7], one of them is Science Teacher Education Program. The purpose of this program is to prepare the future science teachers who have the qualifications in adapting the current information technology development situation.

Many Science Teachers Education Programs are able to select and implement the most effective strategies in preparing teachers who are able to integrate technology in learning [8][9]. This ability
becomes the key of successful learning and it will positively impacts on students’ ability to mastery the content [10].

There have been many studies that discussed the ability to integrate technology in learning [2][3][8][9] through internet use [11], digital media creation [12], practice based learning [7]. However, none of studies investigating the use of technology in developing presentation skills of pre-service science teachers. This skill can be trained by making multimedia [13], such as video laboratory report. The pre-service science teachers will report their experiment results of certain subject in certain course which is Science in Daily Life in video form. The introduction of video Laboratory report start from an interest to provide a rich learning environment for student teachers in science subject by integrating science contents and the practices with technology and arts, developing talents and digital literacy. The process of making video laboratory report integrates all of the process in traditional written laboratory report with various media including videography, verbal, narratives text and music. During the process, student teachers can enjoy their creative processes by expressing their talents to become directors, scripts writer and even the star in their video. It is hoped through the study, student teachers can design, create, and produce video laboratory report using their own experimental data.

Because the use of video laboratory report is relatively new, not many studies exist that directly address its efficacy, there are only few researches regarding the use of video laboratory report. A study conducted regarding the use of video laboratory report for first year secondary school students on the physics topic of motion, inertia, fiction and Newton’s Laws could lead the students for better understanding and improved student’s creativity [14]. Another study revealed that the use of video laboratory report helped students learning for variety student’s learning styles and also improved student’s presentation skills [13].

The first reason behind this study is not intend to shift the use of written laboratory report in science teaching but to give an alternative for our student teachers to present their laboratory findings in a form that is more attractive by integrating arts as a part of it because many professionals in the natural sciences commonly not only using written publications but also using presentations (oral or multimedia) to share their research findings with the scientific community. The second reason is to give the student teachers ability to bring innovation in science teaching as a respond to the fast changing of technology by making digital presentation of their experiment results. And the last, is to encourage the student teachers and understanding that their future students need to be prepared to be ready to live in a community which required them to comprehend not only in one specific skill but also require a wide variety of skills such as the arts, design, creativity, innovation and humanity.

This study has a chance to be questioned because most people believed that when students learn scientific material through conducting lab experiments, they need to record their steps, analyze their results, and discuss the findings using written laboratory report. Many teachers may also emphasize use of the traditional report because the production of the written laboratory report encourages the student to learn more than what is taught in the classroom to help understand the important points of the laboratory activities. We know that the educational value of laboratory reports is widely accepted, from early research of middle school until a final academic study experience in universities. However, after completing a science lab, students are expected to display their results and understanding of the material in a written laboratory report, which may be more difficult for some students to communicate than others. And in many case, we found that they make “copy paste” laboratory report. Therefore, this study aims in developing the use of video laboratory report to develop the pre-service science teacher presentations of information technology in Science in Daily Life Course provided by one of the undergraduate teacher education programs.

2. Methods
A case study methodology was used to study two years cohort of students (pre-service science teacher) registered in Science in Daily Life Course provided by one of the undergraduate teacher education programs. The total students from two cohort were 48 students (4 Males and 48 Females). The approach of the learning activities was project-based learning. The students worked in group to plan, design, conduct, analyze and report the project of to overcome environmental issues in their environments. The result of the project must be reported using video laboratory report. During the process of making
laboratory video report, the lectures provided feedbacks for student’s laboratory report. After finished with the video laboratory report the student uploaded the video to YouTube for peer assessment based on the numbers of likes and comments. Students were invited to complete a questionnaire at the end of the unit and participation was purely voluntary. Interestingly all students chose to complete the questionnaire.

In this study, we developed an instrument tool to assess student’s understanding, creativity and presentation skills through video laboratory report. The questionnaire provided the opportunity for students to respond to a set of structured questions as well as to provide further comment about their experience in terms of making, editing, viewing and the value of making video laboratory report experience. The instrument is a rubric that integrate the components of video aspect and components of a laboratory report. Video aspect of the rubric include the organization of the storyboard, basic video and picture taking techniques, editing, and creativity. Laboratory report aspect of the rubric include the introduction, method, result, discussion and conclusion. They were also asked to express their written opinion about the making of video laboratory report. This enabled the collection of both qualitative and quantitative data. Descriptive statistics were used to ascertain frequency data whilst the qualitative components were analyzed using content analysis. Thematic coding was used draw out the central themes that emerged from both the open-ended questions on the questionnaire.

3. Result and Discussion
There were 48 respondents to the questionnaire. The intention of the survey was to simply determine how the students reacted to the experience of making video laboratory report. The first aspect highlighted was the duration of making video laboratory report. The results are presented in table 1.

| Time               | Less than 3 hours | Between 3 and 6 hours | Between 6 and 9 hours | Between 9 and 12 hours | More than 12 hours |
|--------------------|-------------------|-----------------------|-----------------------|------------------------|-------------------|
| % of students      | 4.17              | 10.42                 | 27.10                 | 31.25                  | 27.10             |

Table 1 Describes that the time students spent for making video report were varied. Most of the students (31.25%) expressed that they need between 9 and 12 hours to produce video report. Students clearly need more than 6 hours to produce the video because it is very clear that the making of a video required the process of shooting and editing. The editing process takes quite a long time because it requires to create project and import, organize, mark, place footage, add effect, clean up and export the video result. Aside from basic work in editing, in making a video laboratory report it is necessary to transform the results of the experiment into an interesting presentation where it requires concepts and ideas. This can be seen from the students’ comments which stated they need more time in making the video laboratory report as follows.

I suggest the lecturer to give us Longer time to work on it.

Giving more time to make it I think 2 weeks.

I hope that the lecturer can give us more time to collect the report because making a good video take a lot of time except if you want your video not really good and I have been experienced it

Overall the students reacted in a positive manner to the project of making video report. The results in Table 2 indicate that, for the majority of students, the opportunity to produce the video laboratory report had been a constructive one.
Table 2. Student questionnaire responses (%).

| Rating                                                                 | Strongly Disagree | Disagree | I am not sure | Agree | Strongly Agree |
|------------------------------------------------------------------------|-------------------|----------|---------------|-------|---------------|
| Producing video laboratory report spends more time than traditional paper Laboratory report. | 2.04              | 14.29    | 4.08          | 53.06 | 26.53         |
| I am excited producing video laboratory report because I can express sense of art through it. | 2.04              | 10.20    | 32.65         | 42.86 | 12.24         |
| I can improve my presentation skills through the production of video laboratory report. | 0.00              | 6.12     | 38.78         | 38.78 | 16.33         |
| I prefer to produce video laboratory report rather than traditional paper laboratory report for my laboratory experiment. | 2.04              | 30.61    | 26.53         | 30.61 | 10.20         |
| I understand better the information in video laboratory report rather than traditional paper laboratory report. | 2.04              | 8.16     | 32.65         | 46.94 | 10.20         |

The first question on the questionnaire again explains that the students need more time to finish video laboratory report. The second question poses very positive information about the making of this type of report, as most students can express their artistic side in making the report. The third question relates to the ability of student presentation, the result of the questionnaire also gives positive information that the students can improve their presentation capability. This is because, during the making of the report, the student analyses carefully since the results should be well presented and easily understood by the video viewers. The students also need to prepare the presentation to capture viewers’ attention and to keep them engaged based on a clear storyline, which helps to understand complex concepts and leaves a lasting impression. This is in line with previous research which states that the use of video can help to improve student's presentation skill [13].

The fifth question revealed that students can understand the information from laboratory activity better when they use video laboratory report. In general, the students prefer to use video laboratory report compared with traditional paper laboratory report if they provided by the longer time to make it. This is also reinforced by student statements as follows.

- Video can show me the clear result of our experiment. But i prefer to make video one by one. If it happens in group, someone will rely to another who can make video well:

- video lab report more effective than written lab report because on video lab report we can more understand about the topics by using animation

- I prefer to choose video lab. It will make us more understand. But for someone who didn't interest about technology it will make they difficult to make the video. I don't like the aspect if the result of our experiment contains with a lot of symbol which is not available in the keyboard.

In term of laboratory activities results, students will have a challenge to be concise in presenting the result in video laboratory report because this concise explanation is not required in the written reports; therefore, the students would certainly have to work very hard to condense their explanations in the report and they think over and over again how to present the results. The challenges faced by students can be reinforced by student statements as follows.

- I like create a video report because its more challenging since we can see the result more often than written.
I do like the video report because I can express my creativity through it. It also doesn't make me bored since I have to come up with new ideas every week on how the video will be, different with the written report that has the same format.

Video is more integrated. It includes more than one aspect, not only scientific writing skills. It also supports the requirement for 21st century's skill. Since video is a new method, as the consequences, many students will meet more difficulties in technical way. Some students may be demotivated due to the challenges arise.

The results of this study indicate that students are able to understand the material well with the video laboratory report. However, given the time required is quite long and also required skills in making videos. The type of video laboratory report usage is more suitable for high school or college students. The approach of learning is done by using the approach of project-based learning so that students are able to present the whole project they make. Furthermore, the use of a video laboratory report is also useful to help prepare students to be able to provide different alternatives in their teaching because students in the future are digital natives who need changes of teaching style [6] and the ability of teachers to face native students should be prepared as early as possible through teacher education programs [7].

4. Conclusion
This study was conducted to improve student ability in doing a presentation using video laboratory report. It is revealed that the video laboratory report can improve students' presentation skills because in the process of making the report students make a good analysis so that the information of experimental activities can be presented and understood more easily by the viewers. The making of this report can also facilitate students to express the sense of art and creativity. Noteworthy in making this report the student needs a sufficient length of time to produce the video so that this type of report is more suitable to be done as a project than a routine report after the experiment in the laboratory.

Acknowledgments
This work would not have been possible without the financial support from Lembaga Penelitian dan Pengabdian kepada Masyarakat (Researches and Community Service Institute), Universitas Pendidikan Indonesia. We are grateful to all of those with whom we have had the pleasure to work during this and other related projects especially students from International Program on Science Education, Faculty of Mathematics and Science Education, Universitas Pendidikan Indonesia.

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