1st International Seminar
STEMEIF (Science, Technology, Engineering and Mathematics Learning International Forum)
Purwokerto April 25th 2019
ISBN: 978-602-6697-36-3

Perception of Teachers and Students by Using Interactive Multimedia to Improve Science Literacy and Self-Efficacy

THWibowo1*,Sunyono2, dan RB Rudibyani3
1Magister Keguruan IPA, Universitas Lampung, Jl. Prof. Dr. Sumantri Brojonegoro, Bandar Lampung 35145, Indonesia
2Departemen Pendidikan Kimia, UniversitasLampung, Jl.Prof. Dr. Sumantri Brojonegoro, Bandar Lampung 35145, Indonesia
3Departemen Pendidikan Kimia, UniversitasLampung, Jl. Prof. Dr. Sumantri Brojonegoro, Bandar Lampung 35145, Indonesia
*trihastutiwibowo@gmail.com

Abstract. The purpose of this study is to analyze and explain Perception of Teachers and Students by Using Interactive Multimedia to Improve Science Literacy and Self Efficacy. The research method was descriptive method.The population in this study were ten junior high school teachers and seventy five junior high school students from five different schools. The data collection used questionnaires and data analysis techniques using percentages. The results showed that the teachers perception of learning using interactive multimedia in the aspect of implementation was low category, because teachers still use books and students worksheet. Teachers perceptions of scientific literacy aspects are low, but teachers have tried to apply them in learning. Furthermore, teachers perceptions of students self efficacy in category
"medium". Students' perceptions for aspects of learning using Multimedia interactive (MMI) and scientific literacy were still low, but on aspect of students self efficacy in the "high" category. Then, the percentage of students requirements of using MMI in learning in "high" category. It can be concluded that using MMI to improve students sains literacy and students self efficacy.

1. Introduction

The new era of globalization, the progress of science and technology caused the flow of communication and information too fast and regardless of national boundaries. To create quality human resources, it couldn't be separated from the role of the world in education through a curriculum which supports of human resources with competitive abilities. Connecting to the world of education, the purposes of 2013 curriculum were to prepared Indonesian people to have life skills as individuals who are faithful, productive, creative, innovative, and affective through strengthening integrated attitudes, skills and knowledge and being able to contribute to life in the community, nation, state and world civilization [7]. Based on the purpose of the 2013 curriculum, people needed science and technology, especially in implementation of daily life, for example, for social experience called scientific literacy. In line with [9] that the effectiveness of scientific literacy for students in making decisions both personal and social. The importance of scientific literacy to creative thinking, problem

ISBN: 978-602-6697-36-3

solving, and high order thinking skills for students. To achieve scientific literacy, students have to confident in their abilities or self efficacy [12]. Self-efficacy refers to the belief of ability to organize and implement the action programs [2]. Self-efficacy could be to predict learning behavior and learning capacity obtain a new skills [13]. Students with low self-efficacy tend to believe that intelligence is inherited from birth, while students with high self-efficacy tried to pursue the goals to control knowledge that involved the challenges and acquires new knowledge and obtains good grades and feels capable of defeating others [8]. When students had high self-efficacy, they will feel confident that they are able to complete learning tasks, both difficult and easy [12].

In order to made students who have high scientific literacy and self-efficacy, one of which is using interactive multimedia. Some researchers showed that the using of interactive multimedia could improve learning completeness, interest and learning outcomes [14] [4]. However, study by PISA (Program for International Student Assessment) 2015 in the field of scientific literacy, Indonesia was 66th from 72 countries with an average score of 403, under the PISA average score [7] and PISA 2012 showed that the average score of student self-efficacy in Indonesia was 375, while the average score of self-efficacy 494. This study places Indonesia was 63rd from 64 countries. Based on result study of PISA. This study to describes the perceptions of teachers and students by using interactive multimedia to improve scientific literacy and self-efficacy.

2. Method

The study was conducted on May 2018 involved five junior high schools with population of 10 teachers and 75 students. The research method used descriptive survey methods, describing information about using of interactive multimedia to improve scientific literacy and self-efficacy. The qualitative data was obtained based on questionnaires. Data were analyzed using manual scoring, each item checked was interpreted by the teacher to agree with the statement and questionnaire. Calculate the percentage of each questionnaire item using the formula [11] and present the criteria according to [1].

Tabel 1. Interpretation of the questionnaire.

Persentase	Kriteria
80,1 - 100,0	Very High
60,1 - 80,0	High
40,1 - 60,0	Medium
20,1 - 40,0	Low
0,0 - 20,0	Too low

3. Result and Discussion

The results of data analysis in this study showed using of interactive multimedia in learning activities was still not applied generally. It is showed in Table 2.

ISBN: 978-602-6697-36-3

Table 2. Perception of Teachers by Using Interactive Multimedia

Item	Statement	Yes (%)	No (%)
1	The school has a computer laboratory	100	0
2	The school has a Wifi or Hotspot facilities	60	40
3	Use multimedia to improve understanding	30	70
4	Use multimedia to improve scientific literacy	10	90
5	Student responses of using science learning media was good	50	50
6	Use interactive multimedia in learning activities	10	90
7	Interactive multimedia with questions that direct to scientific literacy skills	0	100
8	The need of interactive multimedia in learning activities to improving scientific literacy	100	0
Average score		45	55

Based on Table 2, it could be seen that the percentage between "Yes" and "No" have a significant difference in each statement. Only a small of teachers use interactive multimedia in learning activities and the categories was "low" and the percentage to direct students to science literacy skills was "very low".

Table 3. Perception of Students by Using Interactive Multimedia

Item	Statement	Yes (%)	No (%)
1	The teachers use computer laboratory in science learning	5	95
2	The school has a Wifi or Hotspot facilities	60	40
3	The teachers teach with conventional method	50	50
4	In learning activities the teaching material only from text books and students worksheet	80	20
5	The media was used in learning activities provide an opportunity to investigate	40	60
6	Using interactive multimedia to train the ability to reach questions and argue	80	20
7	Students could respect to friends assumption	90	10
Average score		68	32

At table. 3 it showed that there were significant differences between "Yes" and "No" in each statement. Most students answered "No" in statement about the use of computer laboratories in science learning in this case leading to the use of interactive multimedia and have category "high". Most teachers answered "No" in the statement using interactive multimedia in science learning, this statement have "high" category. Then table 4 described data analysis of self-efficacy.

ISBN: 978-602-6697-36-3

Table 4. Peception of Self-Efficacy

Item	Teachers Statement	Yes	No	Students Statement	Yes	No
1	Students have confidence about their skills	40%	60%	Students have confident their skills	60%	40%
2	Teachers have examine sudents self-efficacy	0%	100%	Teachers have provided a questionnaire to examine students self efficacy	0%	100%
3	Students self efficacy skills scaled low-medium	80%	20%	Have confidence to success in the future	70%	30%
4	Students self-efficacy skills scaled medium-high	20%	80%	-		
Average Score		35%	65%		43%	57%

Table 4 showed that the teachers never examined students self-efficacy. It showed the most teachers answer "Yes" in the statement students self-efficacy scaled low-medium and it have "high" category. This is inversely proportional to statement students self-efficacy of their skills which is at a percentage of 60% and have category "medium". There are several discussions in this study.

Teachers Perceptions by Using Interactive Multimedia to Improve Literacy Science. Based on table 2, it showed that most schools have computer laboratories as learning media that could be used. Most schools also have Wifi / Hotspot facilities to support learning in a computer laboratory. The use of computer laboratories as facilities in learning activities could support education in the era of globalization, the use of digital technology has a role in supporting and improving the cognitive processes of students and thinking skills [10]. Learning by using technology could change the learninng environtment which was nominated by the teacher or teacher center learning using a conventional method that should be student-centered learning, then it could improve students scientific literacy. Science literacy could influence students to making decision in both personal and social [9]. Scientific literacy not only to making decision but also influence students creative thinking skills, problem solving and high order thinking skills. However, teachers demand to completing the delivery of all subject matter according specified time [5], the teacher is learning resources. Teachers only use text books and worksheet in learning activity. It couldnt' trained students' understanding and scientific literacy skills as shown in Table 2 with a percentage of 30% and 10%. There were some teachers which used media in the form of Power Point (PPT) in learning activities and the student response is sufficient with a percentage of 50%. The using of PPT in learning activities as a media has become a good start, but a small number of teachers have not used interactive multimedia as a medium in learning, it showed at table 2 which was 10% for "Yes" answer and 90% for "No" answer, it concluded that use interactive multimedia have "very low" categories and the role of interactive multimedia to improve scientific literacy. Based on teachers perception, it showed teachers need interactive multimedia for learning activities to improve scientific literacy and learning outcomes [4] [14].

Perceptions of Students by Using Interactive Multimedia to Improve Science Literacy. Not differ from the teachers perception about using of interactive multimedia. The use of computer laboratories in science learning was 5% and have "very low" categories. However, the way teachers teach using the conventional method the percentage of 50% for "Yes" answers and

ISBN: 978-602-6697-36-3

50% for "No" answers. Because there are some teachers who have tried to use learning models in learning activities, while the learning model used inquiry and discovery learning.

The media used in learning were text books and students worksheet, but there are a small number of teachers who make their own worksheet, it showed from the presentage of 80% for the "Yes" answer and 20% for "No" answer. Then the impact for students, they didnt have the opportunity to investigate and discuss, even though the students are able to accept the reasons and assumptions from friends, it could showed from the percentage of 90% for the "Yes" and have "very high" categories. Based on the results, students agree with using interactive multimedia to improve scientific literacy with a percentage of 80%.

Perceptions of Teachers and Students Toward Self-Efficacy. Self efficacy refers to the belief in a persons ability to organize and implement the action programs, given to produce achievements [2]. Students who have strong beliefs, they could succeed in science assignments and choose the activities, survive in the face of difficulties and were guided by physiological indices that showed their confidence in meeting obstacles [3]. Students with low self-efficacy tend to give up when completing difficult tasks, because they assume that they are not able to complete it, thus making their motivation low and effect to n student academic achievement [6].

The difference in self-efficacy in each individual contains three components, there were magnitude, strength, and generality. Each has important implications in performance, which could be explained into three aspects clearly. First Magnitude (level of difficulty of the task) was a problem related to the degree of difficulty of individual tasks. This component has implications for the choice of behavior that individuals were tried based on expectations of efficacy at the level of difficulty of the task. The individual would try to do certain tasks which he perceives can be carried out and he would avoid the site and behavior that he perceives outside his limits. Second, individuals belief the structure for ability. Strong and steady expectations of individuals will encourage perseverance in trying to achieve goals, even though they may not have supportive experiences. The three behavioral generalities in which individuals feel confident about their abilities. Individuals could feel confident about their abilities, depending on understanding their abilities which specied activity and situation or in varied of activities and situations [2]. Based on Table 4, it could that teachers never measured student self-efficacy. But it could be seen that there was a difference between teacher and student perceptions, which is 40% for "Yes" answers and 60% for "No" answers in the statement students have self-efficacy in their abilities. But another thing was different in the perceptions of students, with precentage of 60% for "Yes" answer and 40% for "No" answer to the statement students self efficacy. Teachers perceptions have "high" category in terms of the low-medium scale of self-efficacy in the abilities possessed by students who have an 80% percentage. This is inversely proportional to the students self efficacy. The low level of teachers self-efficacy was caused the students low self-efficacy.

4. Conclusion

Conclusion in this study is that some teachers could not used interactive multimedia in learning to improve scientific literacy (90%), teachers have not examine students self-efficacy (100%), both teachers and students agree with the use of interactive multimedia in learning to improve literacy science (90%).

ISBN: 978-602-6697-36-3

5. Acknowledgments

This research present goes to my advisor Dr. Sunyono, M.Si and Dr. RB Rudibyani, M.Si for advise and guidance in finishing this research about perception of teachers and students by using interactive multimedia to mprove science literacy and self efficacy. I gratefully thank to all involved in this research.

6. References

[1] Arikunto, S. 2008. Dasar-Dasar Evaluasi Pendidikan. Bumi Aksara: Jakarta

[2] Bandura, A. 1997. Self Efficacy TheExercise of Control, W.H. Freeman and Company. New York

[3] Britner, S. L., & Pajares, F. 2006. Sources of science self-efficacy beliefs of middle school students. Journal of Research in Science Teaching, 43(5), 485-499.

[4] Dharma. 2012. Pengembangan Media Pembelajaran Multimedia Interaktif Untuk Meningkatkan Minat dan Hasil Belajar Peserta didik (Studi Pengembangan di SMP Pasundan 1 Bandung). Tesis. Pendidikan Kewarganegaraan, Universitas Pendidikan Indonesia.

[5] Fitriyah. 2017. Pengaruh Model Pembelajaran Discovery Learning Terhada Hasil Belajar Matematika Siswa SMA MAN Model Kota Jambi. STKIP PGRI Sumatra Barat. Jambi

[6] Isnadini, W., & Rasmawan, R. 2014. Pemberian Corrective Feedback Disertai Reward Terhadap Efikasi Diri Dan Hasil Belajar Kimia Di Sma. Jurnal Pendidikan dan Pembelajaran, 3(8).

[7] Kemendikbud. 2016. Panduan penilaian oleh pendidik dan satuan pendidikan untuk Sekolah Menengah Atas. Jakarta: Kemendikbud.

[8] Komarraju, M., & Nadler, D. 2013. Self-efficacy and academic achievement: Why do implicit beliefs, goals, and effort regulation matter?. Learning and Individual Differences, 25, 67-72.

[9] Lederman, N. G. , J. S. Lederman dan A. Antink. 2013. Nature of science and scientific inquiry as contexts for the learning of science and achievement of scientific literacy. International Journal of Education in Mathematics, Science and Technology. Vol. 1, Pp 138-147. Tersedia di http://files.eric.ed.gov/fulltext/ED543992.pdf. Pada tanggal 30 Oktober 2015, 10:30 WIB. 9 hlm.

[10] Selwyn, neil. 2011. Education and Technology Key Issues and Debats. India : Replika press Pvt Ltd.

[11] Sudjana, N. 2005. Metode Statistika. Transito. Bandung

[12] Tuan, H. L, Chin, C. C & Shieh, S.H. 2005. The developmentof a questionnaire to measure students' motivation towards science learning. International Journal od Science Education, 27(6), 639-654

[13] Van Dinther, M., Dochy, F., & Segers, M. 2011. Factors affecting students' self-efficacy in higher education. Educational Research Review, 6(2), 95-108

[14] Yusrizal. 2008. Penggunaan multimedia dalam pembelajaran untuk meningkatkan hasil belajar siswa. Tesis pada SPS UPI Bandung: Tidak diterbitkan