

THE MOTIVATION IMPACT OF OPEN EDUCATIONAL RESOURCES UTILIZATION ON PHYSICS LEARNING USING QUIPPER SCHOOL APP

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ABSTRACT

The distribution of the education quality in Indonesia is relatively uneven. This affects the quality of secondary school graduates. On the other hand, the national growth of Information Communication Technology usage in Indonesia is very high, including the use of mobile technology. This is an opportunity for the application of OER (Open Educational Resources) in learning. This study aims to look at the impact of the application of the concept of blended learning OER to motivate students, especially in learning physics. The LMS used is Quipper School. This research is the quasy experiment using post test only for control group design. ARCS (Attention, Relevance, Confidence, and Satisfaction) models used in this study to observe the attention factor, relevance, confidence, and satisfaction. The analysis technique used is the analysis of variance (ANOVA). From this research, it is known that the application of the concept of OER in learning, will increase the motivation on the aspects of attention, relevance, and the confidence of the students. Meanwhile, the aspect of satisfaction on learning tends to be the same between applying the concept of OER when compared to the conventional learning face-to-face in the classroom. These findings indicate a positive impact of the application of the concept of OER in learning to student motivation.

Keywords: Motivation, OER, blended learning, ARCS model, education, mobile technology.

INTRODUCTION

The distribution of the quality of education in Indonesia is relatively diverse (Sulisworo, 2016). This affects the quality of secondary school graduates (Ahmad, & Setyaningsih, 2016). On the other hand, the national growth of Information Communication Technology usage in Indonesia, including the use of mobile technology, is very high. There is a tendency that the school-age children already have mobile technology, but its use as a medium of learning is still low. The number of research concerning the use of mobile technology to support better learning have been pretty much done in Indonesia in various fields (Sulisworo, & Supadmi, 2016). The results of this research indicate the presence of

hope and a tremendous opportunity for the utilization of mobile technology in learning (Bodrogini, & Rinaldi, 2016).

The availability of young-age teachers (digital native) in Indonesia that began to replace the old age teachers (digital immigrant) is an opportunity for accelerating the use of mobile technology to improve the quality of learning. The possible constraints facing teachers today to implement mobile learning is the availability of various learning resources (Sulisworo et al., 2016). The higher degree of students' autonomy in learning with broad access to the resources will demand the availability of learning resources that are more flexible and more varied (Sulisworo, & Toifur, 2016). The concept of OER is an opportunity for solving the lack of availability of learning resources for teachers in Indonesia (Harsasi, 2015) as the same phenomena in some other countries (Dutta, 2016; Grimus, 2016).

One of the learning management systems that applies the concept of OER is Quipper School addressed at <https://school.quipper.com/id/index.html>. This application can be used to manage to learn, and also to provide thousands of learning materials that can be accessed directly by students and teachers for free. Some research on this application shows that there are many positive aspects that can be obtained using this application, such as toward the interest of the students, learning outcomes and learning activeness. This study intends to look at the impact of blended learning by applying the concept of OER that uses Quipper School toward students' motivation, especially in learning physics.

THEORETICAL BACKGROUND

OER Definition

OER (Open Educational Resources) is the concept of providing a source of learning, teaching, and research in the public domain or have been released under an intellectual property license, which allows use for free for everyone in non-commercial use (Islim et al, 2016; Mitchell, & Chu, 2014). These learning resources can be used either directly or indirectly through adaptation by the user community (Piedra et al., 2015; Sinclair, & Kalvala, 2016). This concept is also used as a benchmark by UNESCO to improve the quality of education globally.

The impact of the adoption of this OER concept occurs in cost savings, ease of learning resources that encourage interest in learning, the emergence of a more pluralistic learning community, or wider learning network (Atenas et al., 2015; Ozturk, 2015; Guo et al., 2015; Thakran, & Sharma, 2016). OER may include:

- Learning content: the whole learning, storage of learning, learning modules, learning objects, collections, and journals.
- Tools: software to support the development, use, reuse and delivery of learning content including searching and organizing content, content and learning management systems, content development tools, and an online learning community.
- Implementation of learning resources: intellectual property licenses to support the open publication of teaching materials, design principles of best practice, and the location of the content.

Forms of learning resources in the concept of OER can be a full learning management, learning materials, modules, textbooks, streaming videos, tests, software, material or other techniques used to support access to knowledge (Krajcso, 2016; Liu et al., 2015; Zancanaro, 2015).

Quipper School at a Glance

Quipper School is a website that can be used to facilitate technology-assisted learning. It can be said that Quipper School is part of the implementation of the concept of OER as it

includes facilities for learning activities, learning materials in various forms such as modules, textbooks, streaming videos, tests, software, and others to support access to knowledge.

Quipper school's headquarter is based in London. It is widely used in UK, Mexico, Japan, Philippines, and Indonesia. Quipper School in Indonesia started its operation since 2014. So far, users who sign in Quipper School Indonesia at the end of 2015 already more than 50,000 teachers and more than 250,000 students. However, from the number of teachers and students was just 60 percent who become active users monthly. The teachers and students have come from about 10,000 schools (with a ratio of 70 percent and junior high school 30 percent). Each online class in Indonesia alone can accommodate up to 60 students, but teachers can still make an online class as much as needed. This indicates good prospects of this domain.

With Quipper School, learning activities become more flexible, better done in a synchronous and an asynchronous way. In this learning management system, teachers and students have their own account. Teachers can create classes according to their subject, and students can enter into the class by entering the code given by the teacher. Learning interaction can be done by visiting the link to the students about the material, tasks, and specific matters. Interactions can also be done with chat or message. Quipper School provides free facilities and learning materials in the form of very various form of articles, animations, and video tutorials. In addition to the material already available in the system, teachers can also add additional material.

METHOD

The research design is clearly described and appropriate for the purpose of the study.

Research Design

This research is the quasi-experiment using post test only for control group design. The subjects were students in high school grade XI under the material of physics including Vector Analysis of Kinematics, Newton's Law of Gravity and Motion, Elasticity and Harmonic Motion, Work and Energy, Impulse and Momentum, Balance of rigid body and Dynamics of Rotation, Static and Dynamic of Fluid, Kinetic of Gases Theory, Thermodynamics. Treatments made through blended learning for one semester. The number of respondents was 27 students for the control class and 34 students for treatment class.

The dependent variables applied in this study were the four factors of motivation, namely attention, relevance, confidence, and satisfaction. The independent variable is learning strategy in which the control group applied face-to-face learning strategy, while the treatment group applied blended learning (learning by OER concept using Quipper School). The analysis technique used is the analysis of variance (ANOVA) with a margin of error (alpha) of 5%.

Learning Motivation Instrument

The ARCS motivational model of development is used as the learning motivation measurement (Alhazbi, 2015; Chang, & Chen, 2015). ARCS is a systematic model for designing motivating instruction (Chang, & Chen, 2015; Kim, & Yang, 2015). ARCS stands for Attention, Relevance, Confidence, and Satisfaction. Related to the first component i.e attention; it will check whether the online activity increases and may sustain the

students' curiosity and attention. In respect of the second component, it establishes whether the activity is relevant to the needs of the student. It also assesses whether the activity instills confidence in the student and whether the online activities bring about the satisfaction of the students (Chang, & Chen, 2015; Strang, 2016; Strang, 2016a). The data were collected using questionnaire with Likert scale from 1 to 5 (5- point category that used as follows: 5 = strongly agree, 4 = agree, 3 = normal, 2 = disagree, and 1 = strongly disagree). To measure the learning motivation, the questionnaire had been validated with the confidence level 95%. The learning motivation is influenced by four factors i.e. attention, confidence, satisfaction, and relevance (Chang, & Chen, 2015; Kim, & Yang, 2015). The structure of the instrument is presented in Table 1.

Table 1. Questionnaire Structure

Factors	Positive Statements	Negative Statements	Total items
Attention	1,7,16,20	9,12,18	7
Relevance	3,4,5,13,14,21,24	22	8
Confidence	10,26	2,6,15	5
Satisfaction	8,11,17,19,23,27	25	7
Total			27

The example of the statements for each factor are followed:

- Statement No. 1: *Pada awal pembelajaran, ada sesuatu yang menarik bagi saya.* (There was something interesting at the beginning of learning that got my attention.)
- Statement No. 5: *Jelas bagi saya bagaimana hubungan materi pembelajaran ini dengan apa yang telah saya ketahui.* (It is clear to me how the content is related to things I already know.)
- Statement No. 10: *Selagi saya beraktivitas dalam pembelajaran ini, saya percaya bahwa saya dapat mempelajari isinya.* (When I first looked at the learning activity, I had the impression that it would be easy for me.)
- Statement No. 23: *Saya merasa bahagia menyelesaikan dengan berhasil pembelajaran ini.* (Completing the exercises gave me a satisfying feeling of accomplishment.)

Learning Activities

In this study, the learning process was conducted in a semester in accordance with lesson plans set by the school for class XI of physics material. The learning strategy used is blended learning. This strategy is suitable to be implemented in this circumstance as also observed in another school (Mitchell, 2014; Spring et al., 2016). The class activities were used for discussion of the material and also the discussion of tasks and exercises. While the activity of reading, spelling tasks and exercises were done online through Quipper School. In addition, teachers and students can interact through chat and message for certain things. The more materials on the LMS make it easier for teachers to choose materials and activities appropriate to the characteristics of classroom management.

FINDINGS

The descriptive statistics figured out the mean and standard deviation for each factor of the motivation, i.e. attention, relevance, confidence, and satisfaction is shown in Table 2.

Table 2. Descriptive Statistics

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Attention	Control Group	27	25.1481	1.32153	.25433	24.6254	25.6709	22.00	27.00
	Treatment Group	34	29.1176	1.24960	.21430	28.6816	29.5537	27.00	31.00
	Total	61	27.3607	2.35961	.30212	26.7563	27.9650	22.00	31.00
Relevance	Control Group	27	30.0741	2.25194	.43339	29.1832	30.9649	26.00	35.00
	Treatment Group	34	31.6176	1.93868	.33248	30.9412	32.2941	27.00	35.00
	Total	61	30.9344	2.20506	.28233	30.3697	31.4992	26.00	35.00
Confidence	Control Group	27	18.6667	1.73205	.33333	17.9815	19.3518	16.00	23.00
	Treatment Group	34	20.0588	1.47589	.25311	19.5439	20.5738	17.00	23.00
	Total	61	19.4426	1.72747	.22118	19.0002	19.8850	16.00	23.00
Satisfaction	Control Group	27	28.7037	2.16288	.41625	27.8481	29.5593	24.00	33.00
	Treatment Group	34	29.7353	1.97421	.33857	29.0465	30.4241	26.00	33.00
	Total	61	29.2787	2.10659	.26972	28.7392	29.8182	24.00	33.00

Table 2 indicates that for the attention factor, group treatments had an average (19.12) which is higher than the control group (25.15). Likewise for other factors also show the same trend. However, it needs to be analyzed whether these differences are significant enough to see the effect of learning strategies. This descriptive statistic displaying the effect of each independent variable through the one-way ANOVA as presented in Table 3.

Table 3. One Way Analysis of Variance

		Sum of Squares	df	Mean Square	F	Sig.
Attention	Between Groups	237.129	1	237.129	144.327	.000
	Within Groups	96.937	59	1.643		
	Total	334.066	60			
Relevance	Between Groups	35.856	1	35.856	8.268	.006
	Within Groups	255.881	59	4.337		
	Total	291.738	60			
Confidence	Between Groups	29.167	1	29.167	11.481	.001
	Within Groups	149.882	59	2.540		
	Total	179.049	60			
Satisfaction	Between Groups	16.015	1	16.015	3.776	.057
	Within Groups	250.247	59	4.241		
	Total	266.262	60			

From Table 3 above it can be seen that the attention factor, confidence, and relevance between the control group and treatment group were significantly different at the level of error of 5% or 95% level of confidence. So it can be said that in the aspect of motivation such as in the attention factor, confidence, and relevance, the students who follow the application of the concept of blended learning with OER using Quipper School reached the higher score than students who follow face-to-face classroom learning.

The different results are shown in the satisfaction factor. Although Table 2 shows that the average score for this aspect was higher for the treatment group (29.74) than the control group (28.70), but this difference is not significant (see table 3). In other words, students who follow the application of the concept of blended learning with OER using Quipper School has satisfaction at the same level with students who follow classroom face-to-face. Factors that could explain this phenomenon needs to be pursued.

DISCUSSIONS AND CONCLUSION

The issue of digital native and a digital immigrant might still relevant to the discussion if you see the results of this study. Digital generation is the generation that is proficient and devoted to information technology and computer applications. All high school students today are part of a generation Z or digital native generation that has the ability to access unlimited information, both with regard to education and to the interests and personal interests. Changes in learning strategies that provide more authority to the students' learning will make them better able to express themselves.

Everyday behavior in which they love and often communicate through social networks make them increased their attention and confidence while following the concept of learning with OER (Atenas et al., 2015; Islam, & Cagiltay, 2016). Their confidence also becomes higher because, through online activities, they tend to be more sensitive to the issue of differences among students (Grimus, 2016; Tabuenca et al., 2014). They tend to be more tolerant of differences. While the access to more various resources of learning through OER became a factor contributing to their increase in relevance. Students have more extensive knowledge insight with independent access to sources of learning where it is not earned by students who take classroom learning. Differences in access to learning resources that make the difference in the level of relevance between the two groups.

In terms of satisfaction factor, the differences were not significant. Good interaction with teachers and students both in the classroom prevented the quality of learning face-to-face better. It makes the students' level of satisfaction is good. On the other hand, on online learning, students tend to have independent learning that sometimes less require the presence of teachers in interaction with knowledge. When the satisfaction is associated with the acquisition of knowledge of learning outcomes, it is possible that the two strategies had no different. It became the new opportunities that the real application of the concept of OER in learning will keep students' satisfaction, and improve attention, relevance, and confidence.

The importance of the adoption of OER in learning is the quality of teachers. The teacher's role is as a source of information on classroom learning. However, the teacher's role turned into inspiration when students have already got unlimited access to the information. The teacher perceived value and motivation on adoption OER is very important for the learning success (Algers, & Silva-Fletcher, 2015; Al-Sharqi et al., 2016). This capability may still be difficult for teachers who have inadequate IT literacy when faced with online learning. To deal with the shift of this new learning environment, teachers need to master the strategy of online learning with OER which become a new platform in this digital era in order to achieve the expected competencies.

To deal with students who have now mastered the digital world, the need for improving the quality of teachers in mastering some online learning tools is a necessity. Quipper School as one of the tools applying the concept of OER constitutes one of the alternatives to manage a good learning. This study revealed that the application of the concept of OER in learning will increase students' motivation on aspects of attention, relevance, and confidence. While the aspect of satisfaction on learning tends to be the same when either applying the concept of OER or in conventional learning in the classroom face-to-face. These findings indicate a positive impact on the motivation of students from the application of the concept of OER in learning. The application of OER in learning makes education more affordable for students in various parts of Indonesia. In the long term, it will improve the distribution of quality of education or the level of education quality for the whole regions in Indonesia.

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REFERENCES

- Ahmad, A., & Setyaningsih, E. (2016). Teacher Professionalism: A Study on Teachers' Professional and Pedagogic Competence at Junior, Senior, and Vocational High Schools in Banyumas Regency, Central Java, Indonesia. *SOSIOHUMANIKA*, 5(1), 96-106.
- Algiers, A. & Silva-Fletcher, A. (2015) Teachers' Perceived Value, Motivations for and Adoption of Open Educational Resources in Animal and Food Sciences. *International Journal of Emerging Technologies in Learning (IJET)*, 10(2), 35-45.
- Alhazbi, S. (2015, July). ARCS-based tactics to improve students' motivation in computer programming course. In *Computer Science & Education (ICCSE), 2015 10th International Conference on* (pp. 317-321). IEEE.
- Al-Sharqi, L. M., Hashim, K., & Ahmed, H. A. (2016). Perceptions of social media as a learning tool: a comparison between arts and science students. *International Journal of Social Media and Interactive Learning Environments*, 4(1), 92-108.
- Atenas, J., Havemann, L., & Priego, E. (2015). Open Data as Open Educational Resources: Towards transversal skills and global citizenship, *Open Praxis*, 7(4), 377-389.
- Bodrogini, P. W., & Rinaldi, M. (2016). CHAPTER The Promise of Open Educational Resources in Indonesia. *Open Educational Resources: Policy, Costs and*, 105.
- Chang, N. C., & Chen, H. H. (2015). A motivational analysis of the ARCS model for information literacy courses in a blended learning environment. *Libri*, 65(2), 129-142.
- Dutta, I. (2016). Open Educational Resources (OER): Opportunities and Challenges for Indian Higher Education. *Turkish Online Journal of Distance Education-TOJDE*, 17(2), 110-121.
- Grimus, M. (2016). Mobile Learning and Educational Resources. From a Global as well as from a Sub-Saharan Africa Perspective. Holz, O., Aleksandrovich, M., Zoglonek, H. (eds). *Current Trends in Higher Education in Europe*. LIT Erziehungswissenschaft Bd. 75, 163-180.
- Guo, Y., Zhang, M., Bonk, C. J., & Li, Y. (2015). Chinese Faculty Members' Open Educational Resources (OER) Usage Status and the Barriers to OER Development and Usage. *International Journal of Emerging Technologies in Learning (IJET)*, 10(5), 59-65.
- Harsasi, M. (2015). The use of open educational resources in online learning: A Study of Students' Perception. *Turkish Online Journal of Distance Education-TOJDE*, 16(3), 74-87.
- Islim, O. F., Koybasi, N. A. G., & Cagiltay, K. (2016). Use of Open Educational Resources: How, Why and Why Not?. *Executive Editor*, 28(2), 230-240.

- Islim, O. F., & Cagiltay, K. (2016). The Impact of OER on Instructional Effectiveness: A Case Study. *Eurasia Journal of Mathematics, Science & Technology Education*, 12(3), 559-567.
- Kim, E. H., & Yang, H. S. (2015). The Use of the ARCS Motivation Model in Mobile Learning Apps Design. *Journal of Digital Convergence*, 13(4), 69-79.
- Krajcso, Z. (2016). Classification and quality criteria for Open Educational Resources in the field of foreign language learning. *Journal of Language and Cultural Education*, 4(1), 48-59.
- Liu, X., Jiang, Z., & Gao, L. (2015, August). Scientific information understanding via open educational resources (OER). In *Proceedings of the 38th International ACM SIGIR Conference on Research and Development in Information Retrieval* (pp. 645-654). ACM.
- Mitchell, C., & Chu, M. (2014). Open education resources: The new paradigm in academic libraries. *Journal of Library Innovation*, 5(1), 13-29.
- Obradovic, I., Stankovic, R., Kitanovic, O., & Vorkapic, D. (2016). Building learning capacity by blending different sources of knowledge. *International Journal of Learning and Intellectual Capital*, 13(2-3), 135-148.
- Ozturk, H. T. (2015). Examining value change in MOOCs in the scope of Connectivism and Open Educational Resources movement. *The International Review of Research in Open and Distributed Learning*, 16(5).
- Piedra, N., Chicaiza, J., Lopez, J., & Tovar, E. (2015). Seeking Open Educational Resources to Compose Massive Open Online Courses in Engineering Education An Approach based on Linked Open Data. *Journal of Universal Computer Science*, 21(5), 679-711.
- Sinclair, J., & Kalvala, S. (2016). Student engagement in massive open online courses. *International journal of learning technology*. InPress.
- Spring, K. J., Graham, C. R., & Hadlock, C. A. (2016). The current landscape of international blended learning. *International Journal of Technology Enhanced Learning*, 8(1), 84-102.
- Strang, K. D. (2016). Can online student performance be forecasted by learning analytics?. *International Journal of Technology Enhanced Learning*, 8(1), 26-47.
- Strang, K.D. (2016a). Exploring the link between e-learning and performance through a learning analytics lens. *Journal of Interactive Learning Research*, 27(2), 125-152.
- Sulisworo, D. (2016). The Contribution of the Education System Quality to Improve the Nation's Competitiveness of Indonesia. *Journal of Education and Learning (EduLearn)*, 10(2), 127-138.
- Sulisworo, D., Agustin, S. P., & Sudarmiyati, E. (2016). Cooperative-blended learning using Moodle as an open source learning platform. *International Journal of Technology Enhanced Learning*, 8(2), 187-198.
- Sulisworo, D., & Supadmi, R. (2016). A Pedagogical Critical Review of Online Learning System. *International Journal of Languages Education and Teaching*, 4(2), 27-36.
- Sulisworo, D., & Toifur, M. (2016). The role of mobile learning in the learning environment shifting at the high school in Indonesia. *International Journal of Mobile Learning and Organisation*, 10(3), 159-170.
- Tabuenca, B., Kalz, M., Ternier, S., & Specht, M. (2014). Mobile authoring of open educational resources for authentic learning scenarios. *Universal Access in the Information Society*, 1-15.
- Thakran, A., & Sharma, R. C. (2016). Meeting the challenges of higher education in India through Open Educational Resources: Policies, practices, and implications. *Education policy analysis archives*, 24, 37.
- Zancanaro, A., Todesco, J. L., & Ramos, F. (2015). A bibliometric mapping of open educational resources. *The International Review of Research in Open and Distributed Learning*, 16(1).