Improved Understanding of Student Concepts and Skills in Volleyball Learning through Mobile Learning

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Abstract

The development of information systems that is increasingly influential in various aspects of life, one of which is the world of education. One result of the development of information technology that can be utilized in education is mobile learning (M-Learning). The use of M-Learning in volleyball learning at the elementary school level is still rarely developed and used. Though this media can be a means of supporting education can make the learning process active, creative and innovative. M-Learning can enhance learning activities so that it can foster enthusiasm and student motivation. This can help improve students' understanding and volleyball skills which include volleyball, service, passing, and set-up techniques. The research method used is a quasi-experimental method with a nonequivalent control group design. The results showed that M-Learning can improve student understanding and student skills in volleyball learning. M-Learning can improve learning communication between students, both with friends and teachers so that learning creates active and conducive relationships. This has an impact on increasing student motivation. This improvement can improve students' understanding and skills in volleyball learning.

Keywords: Mobile learning; comprehension; volleyball game skills

INTRODUCTION

The impact of the industrial revolution 4.0 requires the world of education to adapt to these changes. One example is the learning system (Rohman & Ningsih, 2018). Meaningful learning occurs when students are active, constructive, collaborative, intentional, contextualized, reflective, and transferring (Jonassen et al., 2003); (Jonassen & Strobel, 2006). School and university educators suggested to use technology to facilitate such learning events, where learning characteristics that are interrelated, interactive and interdependent can produce greater learning than if each of these qualities was approached individually (Jonassen, 1995). Jonassen's ideas are influenced by a model of cognition located, where the importance of context and conversation is emphasized (Brown et al.,

2005); (Lave & Wenger, 2013). Efficient use of technology with twenty-first century skills (Kärki et al., 2018).

Mobile information technology helps people learn in informal daily life situations wherever they go (Kukulska-Hulme et al., 2009). Mobile devices change the nature of learning and enable new methods and teaching (Traxler, 2007). M-learning is a subcategory of e-learning (Attewell & Savil-Smith, 2018), which is defined as 'learning across' through social interaction and content, using personal electronic devices (Crompton, 2013). Students are supported by the features and functions of laptops, e-book readers, mobile phones, tablets and smart phones, regardless of time and place (Veerappan et al., 2014)

The definition of mobile learning includes formal, non-formal and informal learning, learning directed by others or by

oneself, and learning that is spontaneous or designed to meet predetermined goals; the physical environment may be involved or not involved in learning experiences (Crompton, 2013). M-learning is a new innovation in learning. This media is an educational system or concept that utilizes information technology in teaching and learning with the advantage of saving time in the learning process and making student-centered learning. M-learning can be utilized in physical learning, namely volleyball learning. This type of exercise is one of the most popular sports on the planet. Around the world 800 million people participate and play games at least once a week (Kenny & Gregory, 2006). There are certain characteristic phases that are repeated during volleyball matches (game episodes), namely, service, service reception, bait, fouls, blocks, and defense (Zetou et al., 2007). These phases determine the skills that each player must possess so that they can overcome success with the demands of the match (Katsikadelli et al., 2000).

Volleyball learning research has been conducted by (Yudiana, 2015) at the junior high school level. The learning model used is a tactical and technical approach. The results of his research show that learning volleyball games in physical education (physical education) to obtain basic technical skills, understanding volleyball games, and developing developing critical thinking skills is better to use learning models with a tactical approach rather than using a technical approach. However, the realization of the tactic approach did not provide a positive stimulus to interest and increased ability to play volleyball skills. Other studies have been conducted with the research instrument of performance evaluation of eighth grade junior high school students with an Android-based Peer Assessment Model in the Learning of Physical Education in Volleyball Games (Ashari et al., 2016). As a result, the instrument developed by the android-based peer assessment model is validity, reliable, effective, and practical. Peer assessment model based on android basic techniques of volleyball game can be applied to students of class VIII and make students more active, only it must be supported by students' readiness to assess each other, and make sure students understand the rubric.

So far from the results of observations and interviews, students' understanding and skills in learning volleyball games are relatively low. This is partly due to the use of conventional learning models or media which have so far been carried out in primary schools, which are highly dependent on the activeness of teachers or direct learning in teaching. In addition to delivering teaching material using the lecture method, the teacher also gives brief instructions accompanied by examples. With these conditions, learning is centered on the teacher so students become passive. In addition, the use of instructional media is considered as one of the causes. So far, the use of conventional media is relatively ineffective. This is reflected in the learning process of students who look unenthusiastic, their interest and motivation are not so high.

M-learning is a complementary medium of learning that exists so as to provide opportunities for students to repeat the material that has been learned if it has not been mastered. The benefit is that it can provide different experiences in the learning process of students. Therefore, physical education learning media especially in android-based volleyball games need to be developed to utilize M-learning which has the capacity to improve communication with students and the resources and speed of feedback available to them. In addition, students are expected to be more motivated in learning. M-Learning can increase learning motivation, learning desires, and foster student activeness in learning so students can solve their problems in learning (Erlinawati et al., 2014).

The use of M-Learning learning media has the capacity to make communication effective with students and the resources and speed of feedback available to them (Alfarani, 2015). Students have a higher level of change, so they can have motivation and interest when using M-Learning. Furthermore, M-Learning has the characteristics of flexibility to access teaching materials / teaching materials because students easily access anywhere and anytime (Al-Fahad, 2009). Students become students who are really actively involved in behavior, intellectual and emotional involvement in learning.

The use of M-learning in volleyball games at the elementary school level has not been widely used. Though this media can be a means of supporting education can make the learning process active, creative and innovative. The use of M-learning technology can be an appropriate alternative today because this media can touch all the media needed in learning. Physical subjects, volleyball game is a very important teaching material mastered by students because in addition to the provision of knowledge for students is also very useful in life. Therefore, this learning process requires strong motivation to gain understanding and skills. M-Learning can have a positive impact on improving students' abilities because visual information is presented together with verbal information (DiGiacinto, 2007). Students can process information better and are able to produce their own visual representation because they read or listen to the material.

The use of M-Learning can also function to make the learning more meaningful. This media can improve low and high cognitive levels, skills, attitudes, and interests. Thus, the use of M-Learning is expected to overcome volleyball learning problems so far, namely to overcome the low understanding of volleyball concepts and skills. This study aims to determine the effectiveness of the use of M-Learning in improving student understanding and student skills in volleyball learning and knowing the effect of student understanding of student skills in volleyball learning.

METHODS

The study used a quasi-experimental research method. The form of experimental design used is nonequivalent control group design with the experimental group and the control group not randomly selected.

Participant

The participants of this research are the fifth grade students of SDN Regol 10 in Garut Regency. The population of this study was all fifth grade students with a total of 52 people, while the sample used in this study used a saturated sample technique. The saturation sample technique is the determination of the sample when all members of the population are used as samples (Sugiyono, 2013). This technique was chosen because the population is relatively small so the sample used in this study amounted to 52 people who were divided into experimental and control classes, each with 26 people.

Instrument

The instruments used in this study are 1) the application of M-Learning learning media; 2) understanding tests used in the form of objective/multiple choice tests with a total of 20 items; and 3) volleyball skills test according to Aahpher's theory which includes four tests, namely volleyball, service, passing, and set-up.

Procedure

The research procedure is used as a tool to collect data and answer questions. In this research procedure, the researcher discusses methods, data collection techniques, population and research samples, compilers of data collection tools.

Research Preparation Phase

The preparation phase is carried out before giving treatment to the sample, so that it can run according to the objectives of the researcher and the purpose of achievement, the authors make the research literature at the preparation stage as follows: (a) Making mobile learning programs; (b) Make instruments to test students' understanding and skills.

Implementation Stage

The implementation phase is the stage the researcher can carry out on the sample, as is the treatment at the treatment stage at the implementation stage as follows: (a) Give a preliminary test to find out the understanding and skills of volleyball; (b) Divide 2 groups, namely the experimental group and the control group; (c) Conduct initial tests of understanding concepts and skills to experiment and control; (d) Provide treatment by applying learning using mobile learning to the experimental group and conventional learning media to the control group; (e) Provide a final test of students' understanding and skills.

Final Research Stage

At this stage in order to get the results of the research that has been given, the author's actions are as follows: (a) Manage data from pre-test and post-test results; (b) Analyze and

discuss research data; (c) Provide conclusions and suggestions.

Data Analysis

Data analysis of the results of the pre-test and post-test results were analyzed using a statistical test using the SPSS 20.0 for Windows program. The statistical tests performed were the Mann-Whitney non-parametric statistical tests and the Independent Sample T-Test. In addition, the effectiveness of M-Learning in volleyball learning also adapts Hake's theory of normalized gain (N-Gain) to determine the difference between the pre-test and post-test values.

RESULTS AND DISCUSSIONS

Result

a. Effectiveness of the Use of M-Learning Learning Media to Improve Student Understanding

Prates aims to determine the students' initial understanding in volleyball learning before being given treatment. The average score of pre-test scores of students in the experimental class is 68.62. The largest value is 81 while the smallest value is 53. In addition, the average value of the control class pre-test is 66.15 with the largest value of 75 while the smallest value of 60. The value data shows that the pre-test scores of students in the experimental class and the control class have not much difference.

Furthermore, to find out the difference between the effectiveness of the use of M-Learning learning media and conventional learning media, post-test was conducted. The average value of the experimental class gained 76.19 with the highest value of 78, while the lowest value was 62. In contrast to that, the average value of the control class was 70.56. The data shows that the average value after the students' understanding of the experimental class and the control class the difference is quite far. This indicates that there is a difference in effectiveness between the use of M-Learning and the use of conventional learning media.

The difference in the effectiveness of the use of media after learning between the experimental class and the control class can be known by using t-test with the Independent Sample T-Test statistic using equal varianced assumsed. The test criteria is if the significance (P)> 0.05, then H0 is accepted. This means that there is no difference in the effectiveness of the use of M-Learning with the use of conventional learning media in increasing students' understanding of volleyball learning. The results of data analysis can be seen in the table below.

Table 1. Test Results of Two Average Scores Post-Students Understanding

Statistical	Value	Remarks
t-tes (*Equal Variances Assumed*)	3,463	
Df	49	Ho Rejected
Asymp.Sig (2-Tailed)	0,001	

Based on the table above, the value of sig. of .001. This value is smaller than the significance level $\alpha = 0.05$ so that H0 is rejected and H1 is accepted. This means that there are differences in the effectiveness of the use of M-Learning with conventional learning media in increasing student understanding of volleyball learning.

To find out how much the effectiveness of M-Learning in improving student understanding can be seen from the increase before and after learning is measured by the normalized gain value (N-Gain). The following is a comparison of the N-Gain value and the average value of student understanding obtained by students before and after learning.
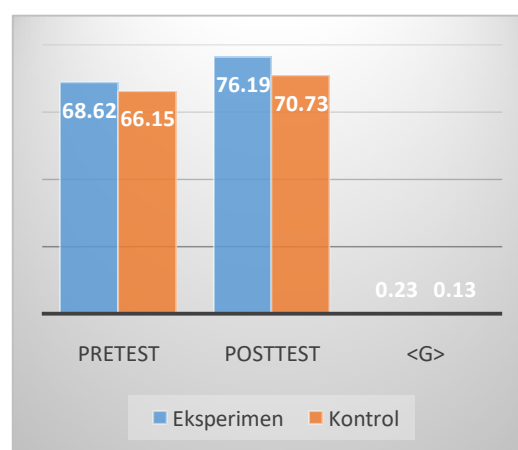
**Figure 1.
Experimental and Control Class Gain Index Results Graph**

The graph above shows the use of M-Learning is effective in increasing student understanding in the experimental class. This

can be seen from the increase in the average value of students' understanding after learning. If previously the average value of students by 68.62 increased to 76.19. The value of N-Gain for increasing students' understanding in the experimental class was 0.23 with a low increase category.

In contrast to the experimental group, the average value of the control class was 66.1. By using conventional learning media an increase in the post-test average value becomes 70.73. The N-Gain value in the control class is only 0.13 with the low category. The increase is still lower than the increase in the experimental class. Furthermore, statistical testing was performed with the help of SPSS 20.0 through parametric statistical tests with the two-test average using the t-test 'with the Independent Sample T-Test statistic using equal varianced not assumsed to prove the hypothesis. Statistical test results show the value of Sig = 0.016 $<\alpha$ = 0.05 then H0 is rejected and Ha is accepted. That is, the use of M-Learning in the experimental class is more effective than the control class that uses conventional learning media. This shows that M-Learning learning has a good contribution in increasing students' understanding of volleyball learning.

The increase is in the following cases: (1) Students can classify (categorize, arrange or sort) basic techniques and movements; (2) Students are able to explain (explain) matters relating to service, type of passing and service; (3) Students can deduce (interpret) how to do service and type of passing; (4) Students can explain (explain) the requirements / number of volleyball players.

b. Effectiveness of the Use of M-Learning Learning Media to Improve Student Skills

The pre-test data shows the average value of the experimental class students' skills is 45.38 with the highest score of 60 and the lowest value of 30, while the average score of the control class pre-test is 42.12 with the highest score of 60 and the lowest value of 30. Thus, the average value of skills pre-test students in the experimental class and the control class the difference is not too far apart. Furthermore, researchers will recapitulate the post-test scores. This value is obtained after using M-Learning in the Experimental class and conventional learning media in the control

class. The average value of the experimental class was 79.96 with the highest value of 96 and the lowest value of 54, while the average value of the control class was 61.19 with the highest value of 67 and the lowest value of 50.

Based on the above value data, the average score of the post-test scores of the experimental class and control class students' differences is somewhat different which indicates that there is a difference in effectiveness between the use of M-Learning and the use of conventional learning media. From the test results show that the value of sig. 0,000. This value is smaller than the significance level α = 0.05 so that H0 is rejected and H1 is accepted. That is, there are differences in the effectiveness of the use of M-Learning learning media with the use of conventional learning media in improving student skills.

The effectiveness of learning media M-Learning in improving student skills in volleyball learning can be seen from the increase before and after learning by using the normalized gain value (N-Gain) as the graph below.
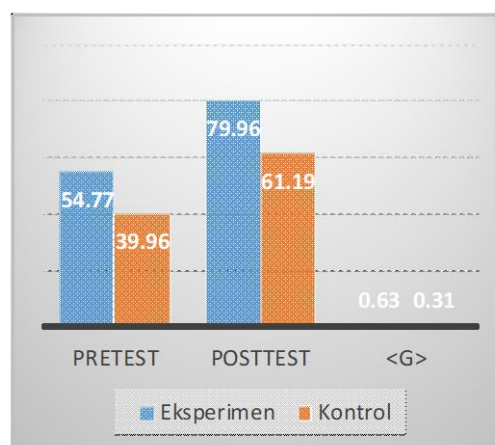
Figure 2.
Experimental and Control Class Gain Index Results Graph

The picture above shows the average value of the previous experimental class of 54.77 increased to 79.96, with the value of the N-Gain to increase student skills in the experimental class of 0.63 which is categorized as a moderate increase. For the control class, the average pre-test score was 39.96, after the treatment there was an increase in the average value to 61.19. The N-Gain value of this control class is 0.31 with the category of

moderate improvement. However, the increase is still lower than the increase in the experimental class. Furthermore, statistical testing is done through parametric statistical tests with a two-test average using t-test with Independent Sample T-Test statistics using equal varianced to prove the hypothesis. With the test criteria based on significance, if the significance (P)> 0.05, then H0 is accepted. Statistical test results can be seen in the table below.

Table 2. Test Results Two Average N-Gain Skills Scores for Students

Statistical	Value	Remarks
t-tes (*Equal Variances assumed*)	6,832	
Df	50	Ho Rejected
Asymp.Sig (2-Tailed)	0,00	

From table 2 it can be seen that the value of Sig = 0.00 <α = 0.05 then H0 is rejected and Ha is accepted. That is, the effectiveness of using M-Learning in the experimental class is higher than conventional learning media in the control class in improving student skills. So, the use of M-Learning is effective than conventional learning media in improving student skills in volleyball learning which includes: volleyball tests, service tests, passing tests, and set-up tests.

c. Data Analysis the Effect of Student Understanding on Student Skills

Based on the calculation results obtained by the correlation value between student understanding and student skills in volleyball games. The experimental class shows the number 0.286. This means that the correlation that occurs between student understanding variables and student skills is 0.286 or 28.6% so there is no significant relationship between student understanding and student skills in volleyball learning. The results of the calculation table can be seen below.

Table 3. Correlation Test Results Students' Understanding and Student Skills in Experimental Classes

		Interest	Understanding
Spearman's rho	Correlation Coefficient	1000	-,286
	Sig. (2-tailed)		,157
Understanding	N	26	26
	Correlation Coefficient	-,286	1000
	Sig. (2-tailed)	,157	
Skills	N	26	26

Based on the table above the correlation shown by the number 0.286 which means that the magnitude of the correlation that occurs between students' understanding and understanding variables is equal to 0.286 or 28.6%. Then, the value of sig. = 0.157> α = (0.05) then H0 is accepted. This means that there is no significant relationship between student understanding and student skills.

In addition, to strengthen the results of the above hypothesis test, researchers conducted a learning completeness analysis to measure what percentage of students' learning completeness in volleyball learning in the experimental class using M-Learning based on the KKM standard standardization of ≥ 70, which is as follows.

Table 4. The Mastery Learning Value of the Experimental Class

Students	understanding Score	Mastery Learning (KKM ≥ 70)
M1	88	Completed
M2	88	Completed
M3	75	Completed
M4	92	Completed
M5	83	Completed
M6	83	Completed
M7	96	Completed
M8	92	Completed
M9	79	Completed
M10	83	Completed
M11	83	Completed
M12	75	Completed
M13	58	Not complete
M14	54	Not complete
M15	83	Completed
M16	75	Completed
M17	96	Completed
M18	71	Completed

Students	understanding Score	Mastery Learning (KKM ≥ 70)
M19	79	Completed
M20	92	Completed
M21	83	Completed
M22	79	Completed
M23	75	Completed
M24	67	Not complete
M25	75	Completed
M26	75	Completed

The table above shows that of the 26 students who took volleyball learning in the experimental class, the percentage of mastery learning was 88.5% complete while the remaining 11.5% was incomplete. So it can be concluded that the use of M-Learning learning media is effective to improve students' understanding and skills in volleyball learning.

Discussion

a. Effectiveness of M-Learning Learning Media in Improving Student Understanding in Volleyball Learning

The initial understanding of students from both the control class and the experimental class showed the same significance value of 0.228 greater than α (0.05). Furthermore, researchers to provide treatment to the experimental class and the control class in volleyball learning. After the treatment, it is obtained that the use of M-Learning learning media is more effective in increasing student understanding than the use of conventional learning media.

During the implementation of learning in general students experience the following difficulties. First, change information, for example translating terms, describing and clarifying. Second, give examples of terms in volleyball games. Third, identify the type of movement. Fourth, restate the material in their own language. Fifth, abstract a concept to explain these examples by examining the characteristics. Sixth, map or match the concept with the image.

When referring the results of testing the hypothesis against the score after students' understanding of the score obtained sig. 0.001 <α (0.05) then H0 is rejected or Ha is accepted. This shows that there are differences in the effectiveness of the use of M-Learning learning media with the use of conventional learning media. Furthermore, the pre-test and post-test values in the experimental class

obtained normalized gain values of 0.23, while the control class was 0.13. This value is interpreted in the <g> value criteria with a low increase.

Furthermore, when testing the difference in the value of N-Gain the results obtained Sig = 0.016 <α = 0.05 then H0 is rejected and Ha is accepted. That is, the use of M-Learning learning media is more effective than the use of conventional learning media in increasing student understanding. In learning, learning media M-Learning can improve student communication with students and students with teachers so that the learning process is student-centered and conducive relationships are created. Students' learning motivation increases because they have confidence and are more active in learning. This is in accordance with the opinions raised by (Alfarani, 2015) as follows.

M-learning to have the capacity to enhance communication with students, as well as the resources and speed of feedback available to them, they are identified technological, institutional, pedagogical and individual obstacle to the use of m-learning in academic contexts which have potentially negative influences on mobile learning acceptance. As educators have higher levels of resistance to change, it is possible that they could have less favorable current and future intentions to use mobile learning because they utilize less mobile devices.

The above statement means that the use of M-Learning has the capacity to improve learning communication, resources, and speed of feedback. Students have a change in motivation and interest when using M-Learning. Correspondingly, the media are able to arouse curiosity and new understanding for students, arouse motivation, and stimulate a desire to learn (Miarso, 2004). The stimulation of learning media M-Learning fosters a desire from within students so that students' understanding can increase due to the desire of students to learn and know more about volleyball learning material.

This situation makes students always remember about what was learned. In addition, with the interesting and fun aspects and easy to use of this learning media makes this media a solution to help students understand the subject

matter, with that failure in the process of understanding the material can be minimized because students can learn the material or material beforehand and can reviewing the subject matter that has been received without limited space and time by accessing M-Learning media. With the advantages and conveniences presented from the media, the understanding that exists in students increases. The statement is in accordance with the opinion of (Arsyad, 2007), which is as follows.

(1) Broadening the horizon of the presentation of learning material given in the classroom, so students will have many choices according to their needs and characteristics; (2) Students will get diverse learning experiences during the learning process; (3) Provide a concrete and direct learning experience to students; (4) Presenting something that is difficult for students to hold, visit or see; (5) Provide accurate and up-to-date information; (6) Increasing the attractiveness of the material display so as to increase motivation and interest and take the attention of students to focus on following the material presented, so it is expected that learning effectiveness will increase as well; (7) Stimulate students to think critically; (8) Improve the efficiency of the learning process; and (9) Help solve problems in education.

Students' understanding can continue to improve if treatment continues to be given that can stimulate student curiosity in learning. Furthermore, M-Learning has the characteristics of flexibility to access teaching material / teaching material because students can access it anytime and anywhere (Al-Fahad, 2009). Students become students who are really actively involved in behavior, intellectual and emotional involvement in learning. Therefore, students are required to be independent and responsible for the learning process, because they can learn anywhere and at any time so that the learning process based on student interests and without coercion will have an impact on student success in the learning process. Teachers should foster motivation by clarifying the sharing of learning objectives with students (Meyer et al., 2008).

The general description before learning shows that students' understanding of volleyball learning is categorized as medium and low, but after the learning process there is an increase in student understanding for the better. This happens because of the treatment in the learning process that can increase student interest and motivation so that students 'understanding of the experimental class using M-Learning learning media tends to be higher compared to students' understanding of the control class using conventional learning media. Comprehensively of 164 studies from 2003-2010 most of the M-Learning learning studies are aimed at increasing the effectiveness of learning (Wu et al., 2012).

b. Effectiveness of M-Learning Learning Media in Improving Student Skills in Volleyball Learning

Student skills are a systematic way of understanding and implementing something that he gets. Each volleyball learning material contains a number of concepts that students must master. The use of instructional media in this study is expected to help students improve their skills in volleyball learning. From the results of the pre-test analysis, it was concluded that the initial skills of students from the control class and the experimental class were the same.

The initial conditions of these students are very supportive for researchers to give different treatment to the experimental class and the control class in volleyball learning. From these data there is an increase in student skills in the experimental and control classes. Then to determine the effectiveness of the use of M-Learning learning media in the experimental class and the use of conventional learning media also used normalized gain calculation based on the pre-test and post-test values in the experimental class. The results obtained are the normalized gain value of the experimental class by 0.56 and the control class by 0.35. The value is interpreted into the <g> value criterion, the experimental and control class is moderate.

Furthermore, from the N-Gain statistical test results obtained Sig = 0.00 <α = 0.05 then H0 is rejected and Ha is accepted meaning that the value of Sig = 0.016 <α = 0.05 then H0 is rejected and Ha is accepted. That is, the use of M-Learning learning media in the experimental class is more effective than the control class that uses conventional learning

media in improving student skills. M-Learning helps facilitate student learning and expands student learning experiences that are more real and close through digital experiences so as to improve student learning performance and effectively helps students to build knowledge and skills in learning (Shih et al., 2010) .

In the learning process in the experimental class that uses M-Learning students are motivated to play a more active role in gaining the opportunity to build their own knowledge so as to obtain in-depth student skills with more variety. The increase in learning outcomes achieved by the experimental class was due to a more conducive, active and enthusiastic learning atmosphere compared to the control class. Especially in terms of the distribution of learning materials that are not centered only on the teacher. The learning culture developed in the experimental class is the activeness of students in building their own curiosity, building the character of the desire to help friends who are struggling, and the optimal use of time because activities are structured.

The above statement is strengthened by the results of the (DiGiacinto, 2007) study which conducted research on health students.

First, students have better formed on outcome tests when visual information is presented concurrently with verbal information. More specifically, if an educator has a choice between a text presentation and a narrative presentation, a narration should be used. This minimizes the load on working memory, so components may process information better.

Based on the quote above, the use of M-Learning learning media can have a positive impact on improving students' abilities. Some important teaching techniques suggested in the results of his research, the ability of students has been better when visual information is presented together with verbal information. This is caused by the minimization of the burden on working memory so students can process information better and be able to produce their own visual representation because they read or listen to the material.

The activeness of students in building their own knowledge is expected to help students to longer remember and understand the subject matter so as to improve student skills. Students can freely operate M-Learning which is used to train their memory and ability to understand various materials in the media. In addition to increasing student skills, several indicators in the learning process are increasing student activity, both in terms of asking questions and presenting tasks that have been completed. This is consistent with what was stated by (Khaddage et al., 2009) as follows:

"... It is through further discovery and research that we hope to produce a blended mobile learning architecture model which will provide a layered prototype for implementation into Universities, covering all major levels of infrastructure. Further research within this study will also look towards the impact of the inclusion of these mobiles devices into the classroom for education purposes. "

That is, learning media M-Learning makes the learning process sustainable. Therefore, by integrating the use of M-learning in the learning environment will broaden students' knowledge to understand subject matter and increase student accessibility. This media will provide a natural and more flexible way to learn. Thus, students can practice independently to get volleyball playing skills, such as service, passing, set-up, and others.

The advantage of implementing meaningful learning-based m-learning is that evaluation can be done immediately after m-learning activities have been carried out, without requiring too much time or additional costs so that the instructor / instructor can increase interest in learning m- learning student learning through increased activity in the use of m-learning (Huang & Chiu, 2015). The entire description above shows that in general volleyball learning by using M-Learning learning media is effective in improving student skills.

Effects of Student Understanding on Student Skills in Volleyball Learning

In addition to knowing effectiveness, this study aims to look at the correlation between student understanding and student skills in volleyball learning. By using the correlation test in the experimental class obtained correlation showed by the number 0.286. That

is, the magnitude of the correlation that occurs between the students' understanding and skills variables amounted to 0.286 or 28.6%. While the value of sig. = 0.157> α = (0.05) then H0 is accepted meaning that there is no significant relationship between students' understanding and skills in volleyball learning.

Although in this study there was no significant correlation between students' understanding and skills, there was still a correlation coefficient of 28.6%. That is, students' understanding variables only affect student skills by 28.6%, while the rest can be influenced by other factors. In addition to student understanding there are still factors that can affect student skills including raw input factors (the student's own factor) because each child has different conditions in physiological conditions (five senses, health conditions), psychological conditions (talent, intelligence, motivation). Learning that is only a model of 'standard transmission' can weaken the development of skills because of the lack of relevance that causes a lack of motivation and ultimately reduces the quality of learning (Saavedra et al., 2012)

Another factor is environmental input (environmental factors), both the natural environment and social environment. Environmental input factors, among others, consist of curriculum, programs/teaching materials, facilities and facilities, as well as teachers (teaching staff). Likewise what happens when the research takes place, there are other factors that influence students 'skills besides understanding, for example the students' physiological, psychological, and environmental conditions. Not all students who show high understanding and skills towards volleyball learning are due to their weak basic abilities (IQ/intelligence), unhealthy physical conditions, even because of the environment, facilities, and infrastructure that do not support the learning process.

CONCLUSIONS

Based on the results of research that refers to the formulation of the problem in this study, researchers draw the following conclusions: (1) The use of M-Learning learning media is more effective than conventional learning media in increasing students' understanding of volleyball learning. With low N-Gain increase qualifications; (2) The use of M-Learning learning media is also more effective than conventional learning media in improving student skills in volleyball learning. From the results of hypothesis testing obtained an increase in gain with a category of moderate increase; (3) In volleyball learning students' understanding does not significantly influence student skills. This is evidenced by the correlation coefficient of 28.6%, meaning that there is no significant relationship between the two variables because based on statistical tests a significance value of greater than α (0.05) is obtained.

REFERENCES

Al-Fahad, F. N. (2009). Students' attitudes and perceptions towards the effectiveness of mobile learning in King Saud University, Saudi Arabia. *Turkish Online Journal of Educational Technology*, *8*(2), 111–119.

Alfarani, L. A. (2015). Influences on the adoption of mobile learning in Saudi women teachers in higher education. *International Journal of Interactive Mobile Technologies*, *9*(2), 58–62. https://doi.org/10.3991/ijim.v9i2.4411

Arsyad, A. (2007). *Media Pembelajaran*. PT. Raja Grafindo Persada.

Ashari, L. H., Lestari, W., & Hidayah, T. (2016). Instrumen Penilaian Unjuk Kerja Siswa Smp Kelas Viii Dengan Model Peer Asssessment Berbasis Android Pada Pembelajaran Penjasorkes Dalam Permainan Bola Voli. *Jurnal of Educational and Evaluation*, *5*(1), 8–20.

Attewell, J., & Savil-Smith, C. (2018). *Learning With Mobile Devices*. learning and skills development agency. https://doi.org/10.4018/978-1-5225-7365-4.ch062

Brown, J. S., Collins, A., & Duguid, P. (2005). Situated cognition and the culture of learning. *Subject Learning in the Primary Curriculum: Issues in English, Science and Mathematics*, 288–305. https://doi.org/10.4324/9780203990247

Crompton, H. (2013). Mobile Learning: New Approach, New Theory. *Handbook of {Mobile} {Learning}*, *5*(4), 47–58.

DiGiacinto, D. (2007). Using multimedia

effectively in the teaching-learning process. *Journal of Allied Health*, *36*(3), 176–179.

Erlinawati, N. A., Suherman, U., & Darmawan, D. (2014). Media Pembelajaran Mobile Learning Untuk Meningkatkan Motivasi Dan Kemampuan Praktikum. *Jurnal Ilmiah Mahasiswa Pendidikan Kimia (JIMPK)*, *1*(4), 52–59.

Huang, Y. M., & Chiu, P. S. (2015). The effectiveness of a meaningful learning-based evaluation model for context-aware mobile learning. *British Journal of Educational Technology*, *46*(2), 437–447. https://doi.org/10.1111/bjet.12147

Jonassen, D. H. (1995). Supporting communities of learners with technology: A vision for integrating technology withlearning in schools. *Educational Technology*, *35*(4), 60–63.

Jonassen, D. H., Howland, J., Moore, J., & Marra, R. M. (2003). *Learning to Solve Problems with Technology: A Constructivist Perspective (2nd. Ed)*. Prentice Hall.

Jonassen, D. H., & Strobel, J. (2006). Modeling for meaningful learning. *Engaged Learning with Emerging Technologies*, 1–27. https://doi.org/10.1007/1-4020-3669-8_1

Kärki, T., Keinänen, H., Tuominen, A., Hoikkala, M., Matikainen, E., & Maijala, H. (2018). Meaningful learning with mobile devices: pre-service class teachers' experiences of mobile learning in the outdoors. *Technology, Pedagogy and Education*, *27*(2), 251–263. https://doi.org/10.1080/1475939X.2018.1430061

Katsikadelli, A., Aggelonidis, I, P, K., & Laios. (2000). *Volleyball*.

Kenny, B., & Gregory, C. (2006). *Volleyball: Steps to Success* (1st ed.). Human Kinetics.

Khaddage, F., Lanham, E., & Zhou, W. (2009). A Mobile Learning Model for Universities -Re-blending the Current Learning Environment. *International Journal of Interactive Mobile Technologies (IJIM)*, *3*(0), 18–23. https://doi.org/10.3991/ijim.v3s1.949

Kukulska-Hulme, A., Sharples, M., Milrad, M., Arnedillo-Sanchez, I., & Vavoula, G. (2009). Innovation in Mobile Learning: A European Perspective. *International Journal of Mobile and Blended Learning (IJMBL)*, *1*(1), 13–35. https://doi.org/10.4018/jmbl.2009010102

Lave, J., & Wenger, E. (2013). Legitimate peripheral participation in communities of practice. *Distributed Learning: Social and Cultural Approaches to Practice*, 56–63. https://doi.org/10.1017/cbo9780511815355.006

Meyer, N. E., Oberegelsbacher, C., Dürr, T. D., Schäfer, A., & Huber, A. (2008). An eGFP-based genetic screen for defects in light-triggered subcelluar translocation of the Drosophila photoreceptor channel TRPL. *Fly*, *2*(1), 36–46.

Miarso, Y. (2004). *Menyemai Benih Teknologi Pendidikan*. Prenada Media. https://books.google.co.id/books?id=rhVNDwAAQBAJ&printsec=frontcover&hl=id&source=gbs_vpt_read#v=onepage&q&f=false

Rohman, A., & Ningsih, Y. E. (2018). Pendidikan Multikultural : Penguatan Identitas Nasional Di Era Revolusi Industri 4.0. *UNWAHA Jombang*, *1*(September), 44–50. http://ejournal.unwaha.ac.id/index.php/snami/article/view/261

Saavedra, A. R., Corporation, T. R., Opfer, V. D., Corporation, T. R., Jackson, T., Kehayes, J., Li, J., & Perkins, D. (2012). *21.Century Skills*. *April*, 1–35. https://www.aare.edu.au/data/publications/2012/Saavedra12.pdf

Shih, J.-L., Chuang, C.-W., & Hwang, G.-J. (2010). Historic monument education: The impact of a collaborative inquiry-based mobile learning strategy on social relationship development. *Mobile Technologies and Handheld Devices for Ubiquitous Learning: Research and Pedagogy*, 138–169. https://doi.org/10.4018/978-1-61692-849-0.ch009

Sugiyono. (2013). *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R & D*. Alfabeta.

Traxler, J. (2007). Defining, discussing, and evaluating mobile learning: The moving

finger writes and having writ... *International Review of Research in Open and Distance Learning*, *8*(2). https://doi.org/10.19173/irrodl.v8i2.346

Veerappan, V., Wei, H., Wong, S., & Paramasivam, S. (2014). Mobile assisted teaching and learning in an institute of higher education. *International Review of Social Sciences and Humanities*, *8*(1), 68–79.

Wu, W. H., Jim Wu, Y. C., Chen, C. Y., Kao, H. Y., Lin, C. H., & Huang, S. H. (2012). Review of trends from mobile learning studies: A meta-analysis. *Computers and Education*, *59*(2), 817–827. https://doi.org/10.1016/j.compedu.2012.03.016

Yudiana, Y. (2015). Implementasi Model Pendekatan Taktik dan Teknik dalam Pembelajaran Permainan Bola Voli pada Pendidikan Jasmani Siswa Sekolah Menengah Pertama. *Kajian Pendidikan*, *5*(1), 95–114.

Zetou, E., Michalopoulou, M., Giazitzi, K., & Kioumourtzoglou, E. (2007). Contextual interference effects in learning volleyball skills. *Perceptual and Motor Skills*, *104*(3), 995–1004. https://doi.org/10.2466/PMS.104.3.995-1004