The Influence of *Flipped Classroom* on the Competence of KKPI Course

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Abstract. The application of conventional learning method at school has provided a cognitive competence of students who did not meet the passing grade and did not use smartphones to help the learning process. The flipped classroom method using moodle mobile based on android can provide solutions for student who did not meet the passing grade. The research purpose are to (1) describe the design of learning KKPI course on moodle mobile based on android, (2) test the significance and, (3) analyze the influence differences of flipped classroom teaching method using moodle mobile based on android and the conventional teaching method using moodle mobile based on android on the cognitive competence of student of remembering, understanding, and applying aspect on KKPI course. This research method is quasi experiment, the research has been conducted for 3 times learning and 1 final test in the class XI computer and networking, Semarang Islamic Center Baiturrahman Vocational High School, academic year 2016/2017. The application of flipped classroom method have the post test score 83.03, the pre test score 40.21, the score has increased 42.82, and conventional method have the post test score 74.62, the pre test score 42.55, the score has increased 32.07. the probability 0.031 smaller than 0.05, the probability score showed the significance differences between flipped classroom method and conventional method, both using moodle mobile based on android, the results of flipped classroom method has provided the cognitive competence of students better than conventional method of operating MySQL database. The research findings can be used to choose methods and learning media of KKPI.

Keyword: Flipped Classroom, KKPI Course, Moodle Mobileandorid

INTRODUCTION

The development of *handhelds* or mobile phones is not only for the purpose of SMS (*Short Message Service*) and making phone calls, but also as smart communication tools (*smartphones*) .Based on survey of APJII (Indonesia Internet Service Providers Association) (APJII, 2016) on internet users in Indonesia there is 50,7% users accessed the internet using mobile phone and computer, 47,6% via mobile phone, and 1,7% through computer. 62% of the users are employee and entrepreneur, 16,6% are housewives, 7,8% are college students, 6,3% are student and 0,6% of others. Very few internet users are included as students and others.

Based on data of smartphone users in Islamic Centre Baiturrahman vocational high School Semarang, class X and XI of sharia banking and computer networking major, 183 student use android, 15 student use Blackberry, 13 others, 4 student use Iphone,1 student use Windows Phone. Therefore, android is most favourable among vocational high school students of Islamic Center Baiturrahman.

The *flipped classroom* learning method with *moodle mobileandroid* as a media to deliver message to achieve learning purpose (Djamarah, 2002:137). The student are successful in learning when they are able to show their behavior changes (Wahidmurni, 2010:18), it is include knowledge, skills, and attitude.

One of *smartphone* utilizations using *moodle mobile* has been done by Resmana Lim, dkk. (2014). *moodle mobile* can be installed on *android* device, this application has many features to access learning resources. Another research by Hassan Sbeity and Ahmad Fadlallah (2014). *E-learning management sistem* (eLMS) is more preferable as online communication platform between student and teacher.

Research by Wahyu Hardyanto, Aryono Adhi, and Aji Purwinarko (2016). Total admission from SPMU was better than SNMPTN over the last five period. It showed the *usability* of http://penerimaan.unnes.ac.id/ page was optimal. Admission facility using web page as the basis of conducted research using *moodle mobile*in http://smkicbaiturrahmansmg.sch.id/e-smkicb/ page, and this page is expected can make the cognitive competences of students better.

Flipped classroom is flipping traditional learning. Many researches showed that *Flipped Classroom* method is relevant with KKPI subject matter, that is Wichai Puarungroj (2015) apply *Flipped Classroom* moodle for computer programming class. Manoj Joseph D Souza and Paul Rodrigues (2015) compare the efectievness of *Flipped Classroom* with traditional class.Chang Xu (2013) using *flipped classroom* method as method that used to develop *Mobile Application Development* class. Research by Jerzy Letkowski (2014) showed that "the important aspect of database management is the design and implemention, and the recomended software is MySQL, the most used, *open source* (can be used free)".

Learning to use *flipped classroom* method can increase students engagement, the students were largely motivated to involve in various class activities, which could solve certain problems previously found in prior classes (Wichai Puarungroj, 2015). Learning media like *moodle mobile* have 3 main functions by Kemp dan Dayton in Arsyad (2005:19) namely "motivate interest and action, present information and give instruction". *Moodle Mobile* has been tested on some android devices, and can run well, students can take the quiz through their smartphone with *moodle mobile (*Resmana Lim, dkk., 2014) and cause time execution is faster and less data consumption during download process when compared to accessing moodle via a regular web browser (Hassan Sbeity dan Ahmad Fadlallah, 2014).

METHOD

This research method is quasi experimentthat include *None equivalent Control Group Design* (Sugiyono, 2010:114), consisting of experimental and control groups. Experimental group learning are using *Flipped Classroom* method with *moodle mobile* based on *android*, control group learning are using conventional method using *moodle mobile* based on *android*.

Population in this research is class XI TKJ 1 with 29 students, and class XI TKJ 2 with 29 students. The next step is conducting the pre-test to look for the learning outcomes average, data homogenity, data normality. After that tests, population is randomized then select one for experimental group and control group using *cluster sample* method (Arikunto, 2006:141).

The variables in this research are independent variable, dependent variable and moderator variable. Independent variable in this research are learning method, that is *flipped classroom* method and conventional method using *moodle mobile* based on *android*, dependent variable in this research are cognitive aspects include remembering, understanding, and applying, moderator variable in this research are attitude of students in learning. data collection techniques were performed with test and non-test. Instrument test using multiple choice 30 questions with five answer options (A, B, C, D dan E).Non-tes instrument include questionnaire, observation, and photo documentation.

RESULTS

This research was conducted for 2 months, lasted from 10 April to 31 May 2017 in Islamic Centre Baiturrahman vocational high school Semarang. Research started with a pre-test to know knowledge of students in operating database software. Pre-test has been done one xperiment and control group.

Design of KKPI learning onmoodle mobile based on *android* below.

Picture 1. KKPI Learning Proccess on *Moodle Mobile*

This research was conducted in 4 meetings, 3 times learning and once for final test, time allocation was 2 x 45 minutes for each meeting. There was a quiz exercise in every learning. In the application there are learning introduction and guide how to use *moodle mobile*.
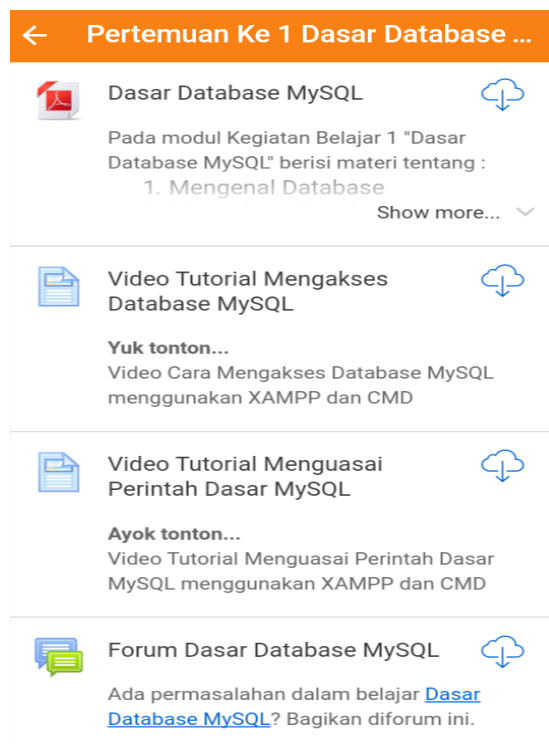
Picture 2. KKPI Contens on *Moodle Mobile* The learning content consisted of *e-book*, tutorial video, discussion forum, quiz, and assignment.
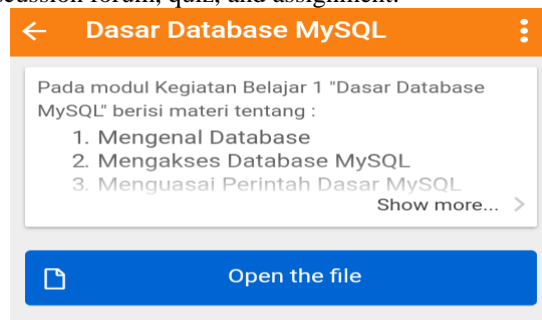

Picture 3. KKPI *E-book* on *Moodle Mobile*

On experimental group, student make resume and questions from *e-book* outside the classroom, while in the classroom students make group and discuss about their resume, teacher explains to students who still have problem in learning the material. On control group, in the classroom students pay attention to the teacher's explanation, discussion, and the outside activity the classroom is e-book learning session.

Picture 4. Tutorial Video on *Moodle Mobile*

Outside of classroom students watch tutorial video, in the classroom students do the lab work following the tutorialvideo.
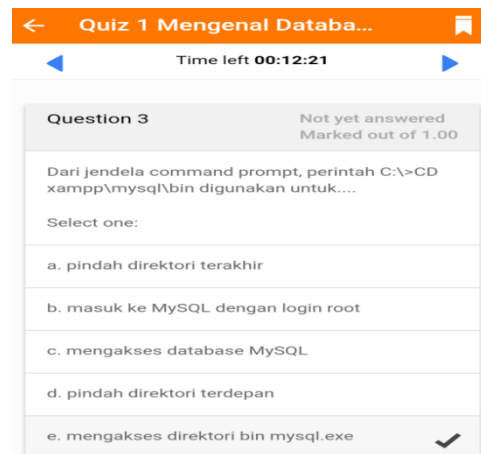
Picture 5. KKPI Quiz on *Moodle Mobile*

On the experimental group, in the classroom students do the assignment and quiz, on the control group, students do the quiz in the classroom, while outside of classroom the students do the assignment.

Based on the pre-test result, the mean value of experimental group is 40.21, the mean value of control group is 42.55. the probability is $0.545 > 0.05$, therefore, there is no difference in pre-test results between experimental group and control group.

The final test result show that mean value of experimental class is $83.03 > 74.62$, the probability $0.031 < 0.05$, it means there is significant differences between *flipped classroom* learning method and conventional learning method in the final post-test on the cognitive competences of student of remembering, understanding, and applying on KKPI course.

Table1.Influence of *Flipped Classroom* and conventional method on Cognitive Competences

Group	N	Cognitive Competences (Remembering, Understanding, dan Applying)							
		Post-test 1		Post-test 2		Posttes 3		Final Post-test	
		Mean	Sig.	Mean	Sig.	Mean	Sig.	Mean	Sig.
Flipped Classroom	29	69.66	0.367	77.59	0.031	79.31	0.064	83.03	0.031
Conventional	29	61.72		66.90		72.41		74.62	
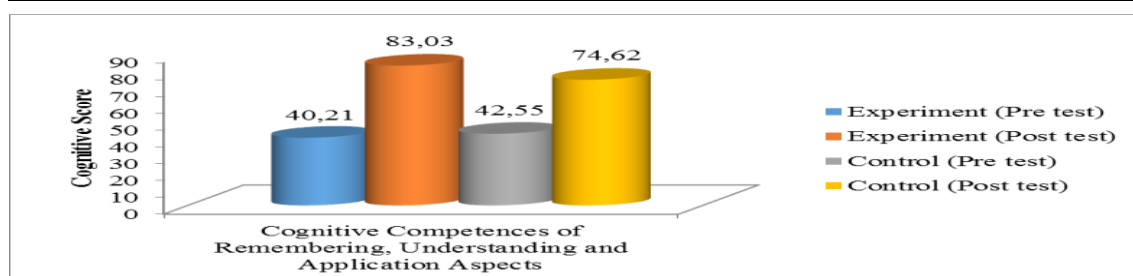
Picture 6. Cognitive Competence Differences of Experiment and Control Grup

Based on the research result, the *pre-test* score was 40.21, after using *flipped classroom* method with *moodle mobile* based on *android*, the *post-test* score was 83.03. The score increased 42.82 after treatment. The *pre-test* score was 42.55, after using conventional method with *moodle mobile* based on *android*, the *post-test* score was 74.62. The score has increased 32.07.

Influence difference of *flipped classroom* and conventional method is 42.82 - 32.07 = 10.75, and mean on the post-test of experimental group is higher than control group, also the probability is smaller than 0.05, the conclusion is the *flipped classroom* using *moodle mobile* based on *android* more influential than conventional method using *moodle mobile* based on *android* in the cognitive competences of student of remembering, understanding, and applying on KKPI course.

Research by Sudarmin, Muhamad Taufiq, Parmin, and Regilita Annisetyas (2016), the research was conducted for 3 meetings, the teachers of ≥ 80% have pass in understanding, identifying the media type, appropriate media selection, how to make a media study card, and applying conservation soft skills in learning.

The treatment was done for 3 times learning, it was in the form of treatment repetition for 3 times learning. It provided a better cognitive competences result, this treatment in is accordance with the theory of connectionism that learning is formation between stimulus and response, and repetetion of the experiences can increase the chance of right response (Hergenhahn, 2008:60), the right response can provide the better cognitive competences result.

The success treatment in the students also is proven by research by M. Elfin Noor, Wahyu Hardyanto, and Hari Wibawanto (2017) that using *e-learning* with project based learning, Research by Sumarni, Wardani, Sudarmin, and Gupitasari (2016) that using *Project Based Learning* method to increase students' psychomotorism in chemistry learning, other research by Ninok Eyiz Sumianingrum, Hari Wibawanto, and Haryono (2017) using *e-learning* with *Discovery Learning* method.

CONCLUSION

Based on the result and discussion, as well as the research purpose, there are three conclutions, namely (1) learning using *moodle mobile* based on *android* was conducted for 3 times learning and one meeting for final test, learning content include *e-book*, tutorial video, discussion forum, and quiz, (2) there was significant difference between *flipped classroom* method and conventional method using *moodle mobile* based on *andorid*, (3) the *flipped classroom* method provided the cognitive competence of students better than conventional method of operating MySQL database.

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