doi: 10.21070/picecrs.v2i1.2417

Mobile Learning Media Development on *Kampung KB* Management Training Material for Family Planning Field Worker in East Java

Widi Asih Nurhajati*

East Jawa Population and Family Planning Board, Surabaya, Indonesia

In facing the 4.0. Industrial revolution era, the usage of technology becomes a prominent needs to enhance the opportunity of learning for Family Planning Field Worker (PKB) in East Java. Therefore a media should be developed to transfer the knowledge of learning material, especially for Kampung KB material as the priority program of Indonesian Population and Family Planning Board (BKKBN) towards all PKB in East Java. The study aims to determine the appropriateness of mobile learning media to develop the learning outcomes of East Java's PKB in mastering Kampung KB management training material. It uses research development method by Gall et al. (2003) . The results indicates that it is proper since the value of the individual test is 93.94%, 88.64% in the small group test, and 87.87% in the large group test. The effectiveness of the media is proven by the average value of the experimental class posttest of = 77.17 while the pretest is only 46.33. The posttest significance value of the experimental class was 0.181> 0.05, so that there were differences in learning outcomes between before and after learning using mobile learning media in the Kampong Management training material

Keywords: mobile learning, Kampung KB, PKB

Dalam menghadapi era Revolusi Industri 4.0., penggunaan teknologi menjadi kebutuhan penting sebagai upaya meningkatkan kesempatan belajar bagi Penyuluh Keluarga Berencana (PKB) di Jawa Timur. Oleh karena itu, suatu media perlu dikembangkan dalam rangka mentransfer pengetahuan tentang materi pembelajaran kepada seluruh PKB Jawa Timur, khususnya mengenai Kampung KB yang merupakan program prioritas Badan Kependudukan dan Keluarga Berencana Nasional (BKKBN). Penelitian ini bertujuan untuk menentukan kelayakan media mobile learning untuk meningkatkan hasil belajar PKB Jawa Timur dalam menguasai mata pelatihan Pengelolaan Kampung KB. Metode yang digunakan adalah metode Research Development oleh Borg dan Gall (2003). Hasil menunjukkan bahwa media tersebut layak karena nilai tes individu adalah 93,94%, tes kelompok kecil 88,64%, dan tes kelompok besar 87,87%. Efektivitas media dibuktikan dengan nilai rata-rata posttest kelas eksperimen = 77,17 sedangkan pretest hanya 46,33. Nilai signifikansi posttest kelas eksperimen adalah 0,181> 0,05, sehingga ada perbedaan hasil belajar antara sebelum dan sesudah belajar menggunakan media mobile learning dalam materi pelatihan Pengelolaan Kampung.

Keywords: pembelajaran mobile, Kampung KB, PKB

OPEN ACCESS
ISSN 2548-6160 (online)

Correspondence:
Widi Asih Nurhajati
widiasihn@gmail.com

Citation:
Nurhajati WA (2019) Mobile Learning Media Development on Kampung KB Management Training Material for Family Planning Field Worker in East Java. Proceeding of ICECRS. :. doi: 10.21070/picecrs.v2i1.2417

INTRODUCTION

We are now facing industrial revolution 4.0 era in which technology has become a basis in human life. The world becomes limitless through internet and digital technology development. Technology has influenced all aspects in human life, such as politic, economic, culture, also education. As stated by Sutopo (2018) one of the aspects in industrial revolution 4.0 includes attempts for transforming human resources to be ready to face changes as consequences of this era. Human plays enormous role in this change. Gorecky et al. (2014) says, "In an Industry 4.0 [context], employees will determine the overall production strategy, monitor the implementation of this strategy, and if need be, intervene in the cyber-physical production system (CPPS)". They will be the problem solver in fixing the fault and developing the potential. It means that in Industry 4.0, human resource development to apply and create the technological tools is important.

In terms of education, one of the advantage of using technology is broaden the opportunity to access learning material and making innovation. It can be applied for all kinds of education, whether it is formal, informal or non-formal education. The Association for Educational Communications and Technology (AECT) defines educational technology as the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources Molenda (2013) . The domain described as follows:

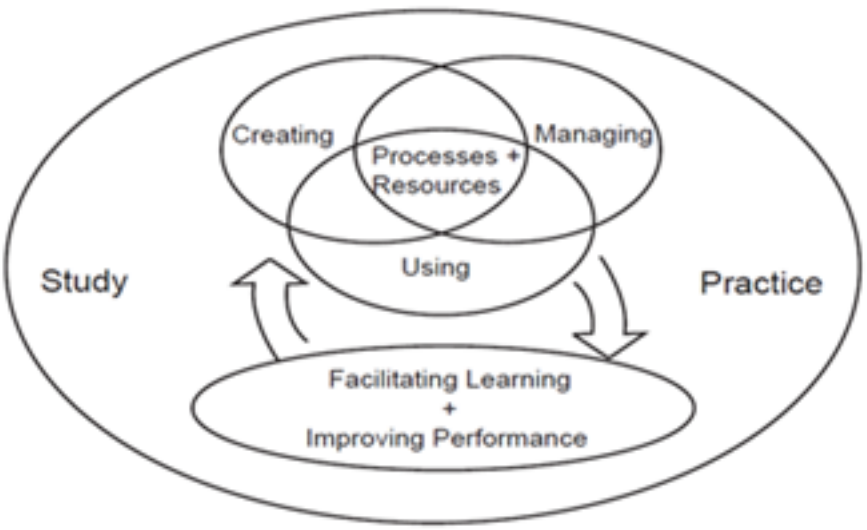

FIGURE 1 | The domain of Educational Technoloy

From the domain above, it is clear that creating plays important role in educational technology. Further, they described that the making of materials, sources or media used for learning refers to the theory of design according to the developer's mindset in order to achieve effective learning.

Family Planning Field Workers (*Penyuluh Keluarga Berencana*/PKB), especially those in East Java, cannot avoid this rapid technology movement. Pfeiffer (2015) states that skilled workers and engineers need their own specific, but mutually compatible experiential and theoretical knowledge, especially in innovative and technology-driven companies where practice-related experience becomes the crucial resource in dealing with unpredictability and complexity and in digitalized worlds of work. It means if a PKB wants to survive he/she must have the ability for technology, including training. Besides, limited fund of training conducted by East Java Population and Family Planning Coordinating Board (BKKBN) has the consequences that not all PKB's in East Java are trained on particular material that enhancing his/her competence.

One of the use of technology in education for achieving effective learning is the utilization

of e-learning. For civil servant training, as stated in the regulation of the head of Indonesian National Institute of Public Administration No.8, 2018, e-learning aims to increase efficiency and effectiveness of competence development; expand the access for civil servant for sustainable competence development: and accelerate improvement in organizational performance. Therefore, e-learning is a tool for achieving organizational goals by giving more access for civil servant to make continuous competence development.

Part of e learning is mobile learning or m-Learning, as ADL defines it as the use of handheld computing devices to provide access to learning content and information resources Haag (2011) . Among the values and benefits of m-Learning are less expensive and lightweight compared to PCs and laptops, decrease the cost of training, and its communication features for larger learning activities Zerehkafi (2013) . Using m-Learning also enable the students to learn anywhere at any time, with no space and time limits. Furthermore, Haag (2011) in his research towards US military and DOD workforce shows that the overall performance of the participants improved when comparing the pretest scores (80%) to their posttest scores (88%) which indicates the effectiveness of m-Learning to increase the participants' result study. From the perspective of the participants, they mostly satisfied with m-Learning compared to e-learning (70%). On the basis of android, another research conducted by Susilo (2018) , shows that Android-based mobile learning media which they develop on the concept of *monera* is worthy of being used as a source of learning for high school students in 10^{th} grade. It means that mobile learning also can be used for PKBs as learning tools, since it is effective, efficient, and worthy. Besides, all PKBs in East Java have been equipped with android based mobile phone to perform their daily duties report. However, this mobile phones haven't been utilized for specific learning.

On the other hand, *Kampung KB* is BKKBN's priority program in which its roadmap ends in 2019. However, only 119 (5.2%) of 2,278 PKBs joined *Kampung KB* training in 2017, while in 2018 it is not specifically intended for PKBs. Therefore a tool is needed so that all PKBs in East Java who haven't been trained are able to understand the training material, especially *Kampung KB* management as the core material. Therefore, by considering the availability of the equipment, the breadth of reach, and cost efficiency, this study develop mobile learning media on *Kampung KB Management* Training Material for Family Planning Field Worker in East Java. By using this media, all PKBs in East Java are expected to be exposed and learned about *Kampung KB management* material without necessarily attend classical training. PKBs are also expected to achieve better learning performance through this media. Thus, this research aims to analyze the appropriateness of the developed mobile learning on *Kampung KB Management* training material and the performance of PKBs who applied this learning media.

RESEARCH METHODOLOGY

The methodology of media development applied in this research is education research and development defined by Borg and Gall (2003, p.569) Gall et al. (2003) as "an industry-based development model in which the findings of research are used to design new products and procedures, which then are systematically field-tested, evaluated, and refined until they meet specified criteria of effectiveness, quality, or similar standards". It means that it is used to develop and validate educational product. The model used by Gall et al. (2003) adapted from the system approach model designed by Walter Dick and Lou Carey, consisted of ten steps as below:

- Assess needs to identify goal

This step includes the definition of objectives for the educational program or product, which often comprises a needs assessment.

- Conduct instruction of analysis

An educational analysis is conducted in step 2 to distinguish the particular abilities, processes, and learning assignment that are involved in accomplishing the objectives of instruction.

- Analyze learners and contexts

Step 3 is intended to spot the learners' entry skills and attitudes, the characteristics of the academic settings where the new knowledge and ability will be applied.

- Write performance objectives

Here the researcher translates the requirements and purposes of instruction into precise performance goals. This provides the basis for specific designing of test substances, instructional items, and the instructional delivery technique.

- Develop assessment instruments

Throughout step 5, measurement tools are developed. These instruments ought to be immediately associated with the knowledge and skills laid out in the performance purposes.

- Develop instructional strategy

In this step a particular educational scheme is developed for helping learners with their efforts to attain every performance goal.

- Develop and select instructional materials

Step 7 involves the improvement of instructional materials or other media, which may contain print material such as textbooks and teacher training manuals, or other media such as audiocassettes or interactive video systems.

- Design and conduct formative evaluation of instruction

Formative evaluation is conducted within the process of program or product development. In certain situations, the results of formative evaluation can produce decisions for further development, so that resources can be maximized and minimize the ineffectiveness of the program or product being developed. There are three types of formative evaluation: one-to-one, small group and field evaluation.

- Revise instruction

The results of formative evaluation are the basis for revising instructions so that the program or product produced is truly effective for learners.

- Design and conduct summative evaluation

Summative evaluation is done to test the extent to which the program or product developed is beneficial for students. Generally the 10^{th} step is not part of the process design because this is usually not done by the learning designer but independent evaluator Therefore, the researcher does not carry out the step into this study

The variables of this research consist of independent and dependent variables. The independent variable is learning media mobile learning (X), while the dependent variables are the appropriateness of the mobile learning media (Y_1) and the students' performance (Y_2). Product of this study is mobile learning media on *Kampung KB Management* training material. Whereas the sampling system using purposive sampling with criteria below:

TABLE 1 | **Respondents of the Research**

Group	PKB Respondent (N)	Origin	Criteria
Eksperiment Class	7	Banyuwangi District	Not participated in Kampung KB training in 2017, have android base smartphone
	8	Pasuruan District	
	7	Bondowoso District	
	8	Situbondo District	
Total Respondents for Experimental Class (N1)	30		
Control Class	6	Lumajang District	Not participated in Kampung KB training in 2017
	6	Jember District	
	7	Probolinggo District	
	6	Pasuruan Municipality	
	5	Probolinggo Municipality	
Total Respondents for Control Class (N2)	30		

The design of the research is using the formula below:

TABLE 2 | Pretest-Posttest Control Design (Sugiyono, 2011:76)

Group	Pretest	Treatment	Posttest
Experiment	O1	X	O2
Control	O3	-	O4

Before the trial is carried out the two groups are given pretest. The pretest results are good if the two groups are not significantly different. Afterwards, the experimental group is given treatment (X) in the form of learning media Mobile learning, while the control group isn't. Then when the learning process accomplished, the two groups are evaluated using posttest.

Data of the research is collected through scaling questions questionnaire to gain the data from the material and media experts, also from PKB as the subjects of this research to measure its appropriateness of the developed media. Formative evaluation is intended to review the design of learning using Mobile learning media on product weaknesses that are developed and used to revise its design. The formula used is:

$$CEA = \frac{\sum_{alternative\ chosen\ answer\ on\ each\ aspect}}{\sum_{alternative\ ideal\ answer\ on\ each\ aspect}} \times 100\%$$

In giving meaning to percentage numbers, as a result of calculations using the formula above, which will be associated with determining whether this media must be revised or not, the following criteria will be used:

TABLE 3 | **Score Criteria**

Percentage	Kriteria
81% - 100 %	Excellent, revision unnecessary
61% - 80%	Good, revision unnecessary
41% - 60%	Less Good, revision needed
21% - 40%	Not Good, revision needed
0% - 20%	Poor, revision needed

Then, the performances of the subjects of this research are tested through test instrument. Before, the validity and of the test items is tested. When r count > r table, then the test item is valid. The reliability of the test is counted using Cronbach Alpha's test, in which when r count > r table, the test is reliable. The calculation uses SPSS version 24.

Analysis of test results is used to compare the acquisition of learning outcomes of students who use Mobile learning media and those who don't. Tests are obtained at the pretest and posttest. Analysis of the data will be carried out twice, where the first analysis is conducted to determine the similarity of the experimental group and the control group pretest, the second was done to find out the similarities in the experimental group and the control group, but before this was done, it must be tested for its normality and homogeneity.

The normality test aims to show that the sample data comes from a population that distributes normally, it can be seen by looking at the results of the calculation of significance. If the significance obtained is> a = 0.05, then the sample comes from a population that is normally distributed, but if the significance obtained is <a = 0.05, then the sample is not from a population that is normally distributed. Ali (2013) . Homogeneity test is intended to show that two or more groups of sample data come from populations that have the same variance. This can be seen through the results of the calculation of significance. If the significance level obtained is> a = 0.05, then the variance of each sample is the same (homogeneous). But if the significance obtained is <a = 0.05, then the variation of each sample is not the same or not homogeneous Ali (2013) . The calculation will use the SPSS Version 24.

To find out the difference in the value of learning outcomes will be used independent test sample t-test. The t test was conducted to see whether there was any influence on the use of Mobile learning media on PKB learning outcomes. The t test was carried out twice, where the first analysis was conducted to find out the similarities in the pretest of the experimental group and the control group, the second was done to find out the similarities in the posttest of the experimental group and the control group. The t test test criteria are as follows: if t count $\leq$ t

table, then there is no significant difference If t count> t table, then there are significant differences. The calculation will also uses the SPSS Version 24.

RESULT AND DISCUSSION

The validation of the material is done by echelon III in East Java BKKBN who is in charge as the leading department for Kampung KB development in this province. Based on the results of the questionnaire by the validator on 13 items questions about the feasibility of the material, according to the recapitulation of questionnaire results data showing the percentage of 90.38% which categorized as excellent. Then, from the media validator evaluation, the percentage of the media feasibility is 89.29% out of 14 items which categorized as excellent. The product tested in individual test (3 PKBs), small group test (10 PKBs), and large group test (30 PKBs from experimental class), each showing the percentage of 93.94%, 88.64%, and 87.88%. All indicates that the media is excellent. The results show that mobile learning media on *Kampung KB management* training material is sufficiently proven to be feasible. It is appropriate to be used as learning media.

The effectiveness of the media developed in improving learning outcomes can be seen from the results of the independent sample test using t-test on the pretest and posttest data values in the control class and experiment. Before the independent sample test on t-test is carried out, the normality test and homogeneity test on the pretest and posttest values in both the control class and the experimental class should be done. Based on the results of the normality test, it is known that the data tested with norm distribution, namely for the control class, obtained a significance value of pretest 0.074> 0.05 and the posttest significance value 0.149> 0.05 while for the experimental class the pretest value was 0.081> 0.05 and the posttest significance value 0.181> 0.05. Likewise, the population selected in the control class and the experimental class with the initial ability are relatively the same, with indicators that the significance value of the pretest is 0.235 and the posttest result value is 0.069, which is greater than 0.05.

Based on the results of the independent sample test using t-test, it is known that the mean for the pretest of the control class is 46.3 and the experimental class is 44.6. Then, the results of the calculation with the sign test obtained a significance value based on the asymp column. Sig (2-tailed) of 0.515 or significance> 0.05 (0.515> 0.05). Thus it can be concluded that there is no difference in the mean value of the pretest of the control class and the average value of the pretest of the experimental class. If there is no difference in pretest value of both classes, it shows that students of both classes the same initial ability. None of the class is more superior to the other.

The mean for the posttest of the control class is 52.6 and the experimental class is 77.17. Then, the results of the calculation with the sign test obtained a significance value based on the asymp column. Sig (2-tailed) of 0,000 or significance <0,05 (0,000 <0,05). It can be concluded that there are differences in the average value of the posttest of the control class and the experimental class. The different posttest result of the control class that does not use mobile learning media and the experimental class with mobile learning media is that there is an effect of increasing learning outcomes on *Kampung KB Management* training material for PKs in East Java Province. This is in line with Irene (2019) research which shows mobile learning media she develops can increase the TOEFL results of the D3 students XII generation at the Naval College of Technology. This is indicated by the high value of the posttest compared to the pretest value after using the android based Mobile Learning. Another research by Taufik (2018) also indicate that android based mobile learning application on direct current of physics subjects is effectively used in learning activities. Results study in class XI of SMK Negeri 2 Kediri displays student learning experiences differences and improvements after using the android based mobile learning application. Hence, mobile learning media on android basis gives positive impact on increasing student's knowledge performance.

This is consistent with the opinion of Suwardi (2007) in his book entitled *Perencanaan Pengajaran*, which states that the use of media has several functions, namely as learning resources and tools. As a tool, the media is used by the teacher to explain the subject matter to students

in the teaching and learning process so that students more easily understand learning material. While the function of the media as a learning resource is helping students to carry out their independent learning without the help of teachers (self-instructional media). In the context of this research the media developed can help trainees in understanding the Kampung KB management training material because the media are able to display material more interestingly. In this case students can optimize their visual function to understand the material contained.

The results of this study are very relevant to the theory of Edgar Dale known as the Dale Cone Experience Rusman (2012) that the difference in the acquisition of learning outcomes through the visual and hearing sense is very prominent. 80% of one's learning outcomes are obtained through the visual sense, 15% through hearing sense, and 5% are other senses. It is very supportive of the use of media that can increase the interest of the PKB to learn about the *Kampung KB management* material independently with interesting visualization.

CONCLUSION

It can be concluded that the mobile learning media on *Kampung KB management* training material is proven appropriate/feasible to be applied as learning media so that PKBs especially in East Java can learn independently without depending on training held by East Java BKKBN. It also evidenced that the learning outcomes of PKB can be increased using this media.

Further utilization of this media is that it can be applied by trainers to assist in the training of *Kampung KB management* training, specifically for PKB in East Java Province. It can also be used independently by PKBs in learning, because there are learning objectives, material, and evaluation, as well as learning media use manuals in it. This development produces a product in the form of Mobile Learning about *Kampung KB* Management material. If this media will be used for other learning programs, it is necessary to identify, analyze the needs and environmental conditions.

Media that has been developed can be refined to make it more effective, and close to perfect so that it is easier for trainees to understand. The effort is to develop the latest media in accordance with the needs of the times.

ACKNOWLEDGMENTS

The researcher would like to express gratitude to everyone who has participate in helping this research, especially to Prof. Mustadji, M.Pd and Dr. Bachtiar S. Bachri, M.Pd from State University of Surabaya who continuously giving supports and advices. The appreciation also goes to Dian Saiful Adiatma, M.Pd who has helped in developing the mobile learning media. The researcher would like to thank East Java BKKBN for the funding support of this research. Nonetheless, highly appreciation goes to all PKBs in East Java who has participated as the respondent of this study. To family and friends whose support that strengthening cannot be described, the researcher is greatly thankful.

REFERENCES

Ali, M. G. (2013). Statistik Untuk Penelitian Pendidikan. Yogyakarta:Nuha Medika

Gall, M., Borg, J., and Borg, W. (2003). Educational Research An Instruction, Sevent Edition (Boston: Pearson Education, Inc), 569–572

Gorecky, D., Schmitt, M., Loskyll, M., and Zühlke, D. (2014). Human-machine-interaction in the industry 4.0 era,

Haag, J. (2011). [JOURNAL BI] From eLearning to mLearning : The Effectiveness of Mobile Course Delivery,. *Ind. Training, Simulation, Educ. Conf*

Irene, S. (2019). Pengembangan Mobile Learning Berbasis Android untuk Meningkatkan Hasil Belajar TOEFL Mahasiswa D3 Angkatan XII di Sekolah Tinggi Teknologi Angkatan Laut,. *Jurnal Mahasiswa Teknologi Pendidikan* 9

Molenda, A. J. M. (2013). Educational technology: A definition with commentary

Pfeiffer, S. (2015). Effects of Industry 4.0 on vocational education and training,

Rusman (2012). Pembelajaran Berbasis Teknologi Informasi dan Komunikasi (Jakarta: PT. Raja Grafindo Persada), 165

Susilo, G. A. S. (2018). Pengembangan Media Pembelajaran Interaktif Pada Konsep Monera Berbasis Smartphone Android,. *WACANA Akad. Maj. Ilm. Kependidikan*

Sutopo, H. P. W. (2018). INDUSTRI 4.0: TELAAH KLASIFIKASI ASPEK DAN ARAH PERKEMBANGAN RISET,. *J@ti Undip J. Tek. Ind*

Suwardi, P. P. (2007) (Jakarta: Gaung Persada Press)

Taufik, M. (2018). Pengembangan Mobile Learning Berbasis Aplikasi Android Mata Pelajaran Fisika Materi Listrik

Arus Searah Kelas XI SMK Negeri 2 Kediri,. *Jurnal Mahasiswa Teknologi Pendidikan* 9

Zerehkafi, Y. M. H. (2013). Mobile Learning for Education: Benefits and Challenges,. *Int. J. Comput. Eng. Res*

Conflict of Interest Statement: The author declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.