

Review Article

THE DESIGN OF DIGITAL TEACHING MATERIAL OF HIGHER EDUCATION IN INDUSTRIAL REVOLUTION 4.0

Rusli^{1*}, Abdul Rahman², Ansari Saleh Ahmar³, & Hastuty⁴

¹Department of Mathematics, Universitas Negeri Makassar, Indonesia

²Department of Mathematics, Universitas Negeri Makassar, Indonesia

³Department of Statistics, Universitas Negeri Makassar, Indonesia

⁴Department of Mathematics, Universitas Muhammadiyah Parepare, Indonesia

*Correspondence Email: rusli.siman@unm.ac.id

Received: 22.11.2019

Revised: 30.12.2019

Accepted: 15.01.2020

ABSTRACT

The purpose of this study was to design digital teaching material of higher education. This study is making the prototype or design of digital teaching material to support the learning of the Industrial Revolution era 4.0. The design of this study adapting by SDLC model. The aim of this study is to digital teaching material in Industrial Revolution 4.0 that can be accessed by students anywhere and anytime without any limitations on time, space and internet quota. The digital teaching material is used on an android mobile.

Keywords: digital teaching material, industrial revolution 4.0, android.

© 2019 by Advance Scientific Research. This is an open-access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>)
DOI: <http://dx.doi.org/10.31838/jcr.07.01.56>

Introduction

UNESCO [1] in its website said that Information and Communication Technology (ICT) can contribute to freedom of access to education, equality in education, delivery of quality learning and teaching, teacher professional development and more efficient management of education, governance and administration.

The Minister of Research, Technology, and Higher Education of Republic of Indonesia in a press conference held at Building D of Kemenristekdikti Jakarta said that in the field of learning and student affairs, the change that must be made is to reorient the curriculum in order to build competence in the industrial revolution era 4.0 by preparing online learning in the form of hybrid or blended learning.

From the description above, it is known that IT has a very big role in the world of education and this is very well done in the lecture process. On the other hand, there are still many universities that have not implemented ICT-Based lectures. This fact drives the writer to develop digital teaching materials in order to face the industrial revolution era 4.0.

According to this argue that technology-enhanced learning approach, Hattie has indicated that [2]:

"An analysis of the meta analyses of computers in schools indicates that computers are used effectively (a) when there is a diversity of teaching strategies; (b) when there is a pre-training in the use of computers as a teaching and learning tools; (c) when there are multiple opportunities for learning (e.g. deliberative practice, increasing time on task); (d) when a student, not teacher, is in "control" of learning; (e) when peer learning is optimized; and (f) when feedback is optimized."

The study of teaching material have been discussed by several researchers e.g. Montrieux, Vanderlinde, Schellens, and De Marez (2015) studied about teachers' and students' perceptions concerning the impact of using tablet devices for teaching and

learning purposes [3]; Sung, Chang, and Liu studied a meta-analysis and research synthesis of the effects of integrated mobile devices in teaching and learning, in which 110 experimental and quasiexperimental journal articles published during the period 1993–2013 were coded and analyzed [4]; Elkhateeb, Shehab, and El-Bakry making a mobile learning system named "Easy-Edu" that can make the learning process easier, focus on students' needs, and encourage communication and collaboration between students and professors and supports collaborative scenario-based learning for university students. [5]; and AlTameemy study the use of mobile phones among students and teachers, explain the their attitudes using mobile phones as learning or teaching tools. [6]

Method

This type of research is the development of research, known as research and development (R&D). The design of this study adapting by SDLC model [7]. The aim of this study is to digital teaching material in Industrial Revolution 4.0 that can be accessed by students anywhere and anytime without any limitations on time, space and internet quota. The design will use the website programming namely HTML. The result of this design will be tested accessible through Android platform. The study is similar with the last study of the authors e.g. Development of Teaching Material Using an Android [8] but differences in concept and design.

Result and Discussion

The design of this online learning using the software development life cycle (SDLC) process with prototype model [7]. There are four stepwise of prototype method of SDLC: (1) Basic Requirement Identification; (2) Developing the initial Prototype; (3) Review of the Prototype; (4) Revise and enhance the Prototype [9].

The initial design of the prototype can be seen in figure 1.

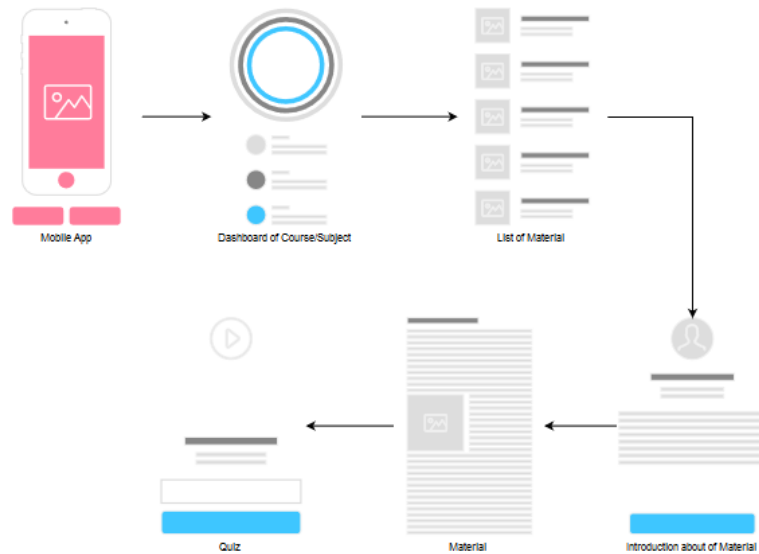


Figure 1 The Full Prototype Design of Online Learning

Figure 1 shows the steps to run the system. First, the user (students) access the teaching material in their Android, then the user will be show the user dashboard. In the dashboard, the user can see the outline of the course material and the lecturer. On the dashboard too, the user can be see list of the sub material, see the sub material, and the last the user can doing the quiz to see their understanding.

Conclusion

Based on the result and discussion, we can conclude that the design and development of digital teaching material can be improve the effectiveness of the learning process and the use of online learning will be a new method/approach of learning systems in the industrial revolution 4.0

Acknowledgement

The authors would like to acknowledge a research grant from Directorate General of Strengthening for Research and Development, Ministry of Research, Technology, and Higher Education Republic of Indonesia (Dirjen Riset dan Inovasi Teknologi) for the funding support of the research project (Hibah Penelitian Terapan Unggulan Perguruan Tinggi Tahun 2019).

References

1. UNESCO, "ICT in Education," 2016. [Online]. Available: <http://www.unesco.org/new/en/unesco/themes/icts/>.
2. J. Hattie, *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. New York: Routledge, 2013.
3. H. Montrieux, R. Vanderlinde, T. Schellens, and L. De Marez, "Teaching and learning with mobile technology: A qualitative explorative study about the introduction of tablet devices in secondary education," *PLoS One*, 2015.
4. Y. T. Sung, K. E. Chang, and T. C. Liu, "The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis," *Comput. Educ.*, 2016.
5. M. Elkhateeb, A. Shehab, and H. El-Bakry, "Mobile learning system for egyptian higher education using agile-based approach," *Educ. Res. Int.*, vol. 2019, no. 7531980, pp. 1-13, 2019.
6. F. AlTameemy, "Mobile Phones for Teaching and Learning: Implementation and Students' and Teachers' Attitudes," *J. Educ. Technol. Syst.*, 2017.

7. S. Radack, "The System Development Lifecycle (SDLC)," USA, 2009.
8. A. S. Ahmar and A. Rahman, "Development of teaching material using an Android," *Glob. J. Eng. Educ.*, vol. 19, no. 1, pp. 72-76, 2017.
9. A. S. Ahmar, R. Hidayat, D. Napitupulu, R. Rahim, Y. Sonatha, and M. Azmi, "EConf: An Information System to Manage the Conference," in *Journal of Physics: Conference Series*, 2018, vol. 1028, no. 1.