

Usage Concepts of Augmented Reality Technology in Islamic Study

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Abstract

The augmented reality (AR) has been identified to be suitable for use in education. However, studies that particularly identify this concept are still rare. Therefore, this qualitative study was conducted with objectives to determine the perception of teacher educators from the Islamic Study Department, Teacher Training Institute in Central Zone of Malaysia towards AR, and to develop a usage concept that can be implemented when teaching and learning Islamic Study. Explorative case study method involving three teacher educators was used. They were interviewed by using an in-depth semi-structured interview schedule. From the interview, all responses provided by the informants are very positive and admitted that AR technology is suitable to be used in the Islamic Study. The usage concepts discussed in this paper can be used as guidelines to those who are interested in developing or using the AR application based on Islamic Study topics.

Keywords: Augmented reality; Visual informatics; Islamic study; Instructional technology; Usage concept

References

- Aw, K. S., & Halimah, B. Z. (2010). Live Solar System (LSS): Evaluation of an Augmented Reality book-based educational tool, Paper presented at the Information Technology (ITSim), 2010 International Symposium, 15-17 June 2010, Kuala Lumpur, Malaysia.
- Azuma, R. T. (1997). A survey of augmented reality. In *Presence : Teleoperators and Virtual Environments*, 6(4), 355-385.
- Billinghurst, M. (2002). Augmented reality in education. Retrieved from <http://www.newhorizons.org/strategies/technology/billinghurst.htm>. Retrieved on 19 February 2012.
- Billinghurst, M., Kato, H., & Poupyrev, I. (2008). Tangible augmented reality, paper presented

at the ACM SIGGRAPH ASIA 2008 Courses, Singapore.

Bimber, O., & Raskar, R. (2005). *Spatial augmented reality : Merging real and virtual worlds*: A K Peters, Ltd. MA, USA.

Chen, Y.-C. (2006). A study of comparing the use of augmented reality and physical models in chemistry education, Paper presented at the VRCIA 2006, Hong Kong.

Educause Learning Initiative. (2010). 7 things you should know about Augmented Reality,. Retrieved from <http://net.educause.edu/ir/library/pdf/ELI7007.pdf>. Retrieved on 30 May 2012.

Elango, P., & Halimah, B. Z. (2009). Augmented reality as a remedial paradigm for negative numbers: Content aspect (pp. 371-381).

Elango, P., & Halimah, B. Z. (2011). Augmented reality remedial worksheed for negative numbers: Subtraction operation. In Halimah B. Z., P. Robinson, M. Petrou & P. Oliver (Eds.), *Visual Informatics: Sustaining Research and Innovations*, London: Springer-Verlag Berlin Heidelberg.

Freitas, R., & Campos, P. (2008). SMART: a System of augmented reality for teaching 2nd grade students, paper presented at the Proceedings of the 22nd British CHI Group Annual Conference on HCI 2008: People and Computers XXII: Culture, Creativity, Interaction - Volume 2, Liverpool, United Kingdom.

Gagne, R. M., Wager, W. W., Golas, K. C., & Keller, J. M. (2005). *Principles of instructional design* Fifth edition: Thomson Wadsworth. USA.

Hafiza, A., & Halimah, B. Z. (2010). Rekabentuk dan pembangunan penceritaan digital dan teknologi realiti tambahan (augmented reality) untuk membantu pelajar pemulihan membaca Bahasa Melayu, paper presented at the Regional Conference on Knowledge Integration in ICT (INTEGRATION2010), Kolej Universiti Islam Antarabangsa Selangor (KUIS).

Huda Wahida, R., Fauziah, B., Harryizman, H., Ali Yusny, D., Haslina, M., & Norida, M. D. (2010). Using augmented reality for supporting learning human anatomy in science subject for Malaysian primary school, paper presented at the Regional Conference on Knowledge Integration in ICT (INTEGRATION2010), Putrajaya. Malaysia.

Juan, C., Beatrice, F., & Cano, J. (2008). An augmented reality system for learning the interior of the human body, paper presented at the Advanced Learning Technologies, 2008. ICALT '08. Eighth IEEE International Conference on 1-5 July 2008.

Kaufmann, H. (2006). The potential of augmented reality in dynamic geometry education, paper presented at the 12th International Conference on Geometry and Graphics (ISGG), Salvador, Brazil.

Kaufmann, H., & Meyer, B. (2008). Simulating educational physical experiments in augmented reality, paper presented at the ACM SIGGRAPH ASIA 2008 Educators Programme, Singapore.

Khalil, M. K., Paas, F., Johnson, T. E., & Payer, A. F. (2005). Interactive and dynamic visualizations

in teaching and learning of anatomy: A cognitive load perspective. *The Anatomical Record Part B: The New Anatomist*, 286B(1), 8-14. doi: 10.1002/ar.b.20077

Merriam, S. B. (2009, p. 80). *Qualitative research: A guide to design and implementation*: Bossy-Bass.

Mubarikah, H. R. (2009). *Perancangan dan implementasi interaksi untuk media pembelajaran manasik berbasis teknologi augmented reality*, unpublished Master Thesis, Institut Teknologi Bandung, Bandung, Indonesia.

Norabeerah, S., Halimah, B. Z., & Azlina, A. (2011). Technical skills in developing augmented reality application: Teachers' readiness. *Visual informatics: Sustaining research and innovations*. In B. Z. Halimah, P. Robinson, M. Petrou, P. Olivier, T. Shih, S. Velastin & I. Nyström (Eds.), (Vol. 7067, pp. 360-370): Springer Berlin. doi: 10.1007/978-3-642-25200-6_34

Norziha, M. M. Z., Halimah, B. Z., & Azlina, A. (2009). Learning science using AR book: A preliminary study on visual needs of deaf learners, paper presented at the IVIC Visual Informatics: Bridging Research and Practice, Kuala Lumpur. doi: 10.1007/978-3-642-05036-7_80

Norziha, M. M. Z., Halimah, B. Z., & Azlina, A. (2010). Developing augmented reality book for deaf in science: The determining factors, paper presented at the International Symposium on Information Technology 2010, ITSIM'10, Kuala Lumpur, Malaysia.

Rasimah, C. M. Y., Halimah, B. Z., & Azlina, A. (2011). Evaluation of User Acceptance of Mixed Reality Technology, *Australian Journal of Educational Technology*, 27(Special Issue, 8), 1369-1387.

Roslinda, R., & Halimah, B. Z. (2009). Augmented reality basic reading courseware for down syndrome learner: A preliminary analysis, *Malaysian Journal of Information & Communication Technology (MyJICT)*, 1, 1-14.

Scheiter, K., Wiebe, E., & Holsanove, J. (2009). Theoretical and instructional aspects of learning with visualizations R. Zheng (Ed.) *Cognitive affects on multimedia learning* : Premier reference source Retrieved from IGI Global database. Retrieved from <http://www.knowfree.net>

Shelton, B. E. (2003). *How augmented reality helps students learn dynamic spatial relationships*, unpublished Doctoral Dissertation, University of Washington, Seattle. USA.

Smaldino, S. E., Russell, J. D., Heinich, R., & Molenda, M. (2005). *Instructional Technology and Media for Learning (Eighth Edition ed.)*: Pearson Prentice Hall.

Soga, M., Matsui, K., Takaseki, K., & Tokoi, K. (2008, 1-5 July 2008). Interactive learning environment for astronomy with finger pointing and augmented reality, paper presented at the *Advanced Learning Technologies, 2008. ICALT '08*. Eighth IEEE International Conference on Advanced Learning Technology.

Sumadio, D. D., & Rambli, D. R. A. (2010). Preliminary evaluation on user acceptance of the augmented reality use for education, paper presented at the *Computer Engineering and*

Applications (ICCEA), 2010 Second International Conference on 19-21 March 2010.
The European Commission. (2006). The ARiSE Project. Retrieved from <http://www.arise-project.org/>. Retrieved on 28 March 2011.

Ucelli, G., Conti, G., Amicis, R., & Servidio, R. (2005). Learning using augmented reality technology: Multiple means of interaction for teaching children the theory of colours (pp. 193-202), In Maybury M., Stock O., Washlster GmbH, pp. 193 - 202. doi: 1-.1007/11590323_20

Vilkoniene, M. (2009). Influence of augmented reality technology upon pupils' knowledge about human digestive system: The results of experiment, *US-China Education Review*, 6(1), 36-43.

Wiersma, W., & Jurs, S. G. (2005, p. 316). *Research methods in education: An introduction* (8th Version), Boston: Pearson Education Inc. USA.

Zagoranski, S., & Divjak, S. (2003, 22-24 Sept. 2003). Use of augmented reality in education. Paper presented at the EUROCON 2003. Computer as a Tool. The IEEE Region 8.