

**THE DEVELOPMENT OF ONLINE WRITING QUIZ FOR PRESCHOOL
CHILDREN BASED ON USER CENTERED DESIGN (UCD)
METHODOLOGY**

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UNIVERSITI UTARA MALAYSIA

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**THE DEVELOPMENT OF ONLINE WRITING QUIZ FOR
PRESCHOOL CHILDREN BASED ON USER CENTERED
DESIGN (UCD) METHODOLOGY**

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Communication Technology)
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By
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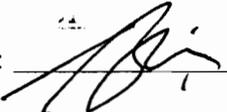
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ABSTRAK

Kajian ini adalah untuk membangunkan satu laman web kuiz berbentuk tulisan kepada kanak-kanak tadika. Pembelajaran kuiz atas talian lebih fokus kepada hiburan berbanding kuiz tulisan tangan. Kuiz atas talian pada hari ini lebih sesuai kepada peringkat sekolah rendah dari segi kandungannya. Selain itu, *user interface* laman web lebih rumit untuk digunakan oleh kanak-kanak tadika. Ciri-ciri multimedia adalah matlamat utama untuk membangunkan laman web. Tambahan lagi, dengan menggunakan teknik yang infektif untuk membangukan laman web ini. Projek ini menggunakan metodologi *User Centered Design (UCD)* sebagai analisis untuk membangunkan projek. Keputusan projek ini menunjukkan ketepatan penulisan dapat diukur di dalam laman web ini.

ABSTRACT

This paper presents to develop an online writing quiz for preschool children. It is because there are many problems in online quiz. The problem is an online quiz is not specific in writing but more for entertainment. Moreover, the content of the online quiz is suitable for primary school to learn. Besides, an interactive user interface more complex for preschool children to use. The main goal of the project is to identify the content requirement for website. Furthermore, to develop online writing quiz with suitable an interactivity technique and to evaluate the usability of the website. The analysis for this project is using User Centered Design (UCD) as a methodology. Finding of the project will be achieving the accuracy of the application.

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LIST OF ABBREVIATION

Acronym	Meaning
UCD	User Centered Design
CW	Curriculum Web
OHR	Online Handwriting Recognition
HRS	Handwriting Recognition System
CTML	Cognitive Theory of Multimedia Learning
swf	shockwave flash

CHAPTER 1

INTRODUCTION

This chapter includes background of the project, problem statement, research question, objective of the project, scope of the project and significant of the project. This chapter end with describes of the project structure.

1.1 Background

Nowadays, multimedia technology gives an impact in enhancing an education system. The multimedia technology gives a different way to expose information for computer users. It is available for people to get information and also generate an idea using the combination of multimedia element. Furthermore, it also can create and running these applications with any current hardware and software. An improvement of multimedia technology also can make product to be more useful. Multimedia technology gives a maximum effect in education especially in current and future curriculum development (David, 2003). It can be a new tool for learning such as assisting online learning activities. This situation happens since the technology has many elements. According to Kleen & Shell (1994), multimedia technology include element such as text, animation, motion graphic, hypermedia,

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REFERENCE

- Adreson, T., & Elloumin, F. (2004). *Theory and Practice of Online Learning*. Athabasca University, Retrieved July, 10, 2010 from http://cde.athabascau.ca/online_boo/pdf/PO_book.pdf
- Aggarwal, A. K., & Bento, R. (2000). *Web-based Education*. Hershey, PA: Idea Group Publishing.
- Ahmad Hassan (2009). Young children need to play!. Retrieved August, 28, 2010 from <http://illinoisearlylearning.org/tips.htm>
- Alexander, P. (2007). Education benefit of online learning. Retrieved August, 20, 2010 from www.blackboard.com
- Ardito, C. (2006). An approach to usability evaluation of e-learning application. *Journal of Information Society International*, 4(3), 270-283.
- Asmaa, A. (2009). Using heuristics evaluation for children e-learning application. *Journal of Computer Education*, 425-430.
- Azhar Mohammad (2006). *Learning with technology*. Indonesia: Astaka Publisher.
- Bearne, E. (2007). *Making progress in English*. London: Rout ledge.
- Burge, C. (2009). On-line handwriting recognition. *Journal of Computer*, 7 (6), 1,289-1,303.
- Billingsley, M. (2003). *Curriculum webs a practical guide o weaving the web into teaching and learning*. United Stated: Person Education, Inc.
- Brown, M. (2007). Designing and testing a tangible interface prototype. *Journal of Computer*, 25-28.
- Cordella, L. T. (2007). Recovering dynamic information for handwriting. *Journal of Science Education*, 26, 409-419.
- David, K. (2003). How effective is multimedia in online Training?. *Journal of Science Education*, 411-430.
- David, D. G. (2009). Exploring collaborative online learning. *Journal of Science Education*, 5, 22-34.
- Funda, D., & Aynur, G. (2010). Relations between online learning and learning style. *Journal of Technical Educational*, 1, 862-871.
- Gorsky, P., & Caspi, A. (2007). Dialogue : A theoretical framework for distance education instructional system. *British Journal of Education Technology*, 36(3), 137-144.
- Graves, D. (2009). *Writing : Teacher and children at work*. New Hampshire: Heinemann.
- Janet, C. R. (2005). Cobweb-A handwriting recognition based writing environment for children. *Journal of Computer Interaction*, 8, 135-149.
- Kneer, S. (2006). From off-line to on-line handwriting recognition. *Journal of Computer*, pp. 303-312.
- Lisa, A. (2008). Adapting handwriting recognition for application in algebra learning. *Journal of Human Computer*, 47-56.
- Lorette, G. (2007). On-line handwritten word recognition. *Journal of Computer Science*, 385-390.
- MacKenzie, I. S., & Chang, L. (1999).A performance comparison of two handwriting recognize. *Interacting with Computer*, 11, 283-297.
- McCraken, P. (2004). *User Centered Design Methodology*. United Stated: Preston.

- Mayer, R. E. (2001). A Cognitive Approach to instructional design for multimedia learning. *Journal of Science Information*, vol. 8.
- Mayer, R. E. (2003). Element of science of e-learning. *Journal of Education Computer Research*, 29(3), 297-313.
- Mayer, R. E. (2009). *A cognitive theory of multimedia learning: implications for design principles*. California: Houghton Mifflin Company.
- Mayer, R. E. (2010). Cognitive theory of multimedia learning (Mayer). Retrieved August, 02, 2010 from <http://www.learning-theories.com/cognitive-theory-of-multimedia-learning-mayer.html>
- Naidu, S. (2003). *Learning & Teaching with Technology*. UK: Great Britain by Biddles Ltd.
- Norman, K. L. (2010). Handwriting recognition. Retrieved on August, 25, 2010 from www.wikipedia.com
- Niels, R. (2006). Automatic trajectory extraction and validation of scanned handwriting character. *Journal of Computer System*, 2, 234-240.
- Nick, R. (2007). Design of online quiz question to faster deep learning. *Journal of Education*, 1, 340-347.
- Patricia, C. (2008). Success in on-line learning. *Journal of Education*, 5, 75-78.
- Piaget, J. (1970). Piaget developmental theory. Retrieved July, 10, 2010 from <http://www.learningandteaching.info/learning/piaget.html>
- Plamondon, R. (2007). On-line and of-line handwriting recognition. *Journal of Computer Education*, 22(1), 63-84.
- Ravikumar, T. (2010). Curriculum sequencing using quizzes and statistics. *Journal of Science Education*, 110-120.
- Read, J. C. (2007). A study of the usability of handwriting recognition for text entry by children. *Journal of Computer*, 19, 57-69.
- Robert, J. L. (2010). The five minute quiz. *Journal of Accounting Education*, 21, 261-265.
- Ruslan, K. (2010). A computer system for graphmetric handwriting analysis. *Journal of Computer System*, 6, 342-352.
- Saddik, E. (2007). A multimedia handwriting learning and evaluation tool. *Journal of Science Computer*, 7, 512-519.
- Saila, O. (2006). Initial observations on children and online instructions. *Journal of Computer Science*, 93-96.
- Sargur, N. (2008). On-line and off-line handwriting recognition: A comprehensive survey. *Journal of Computer Science*, 22 (1), 83-96.
- Santosh, K. C. (2009). A comprehensive survey on on-line handwriting recognition technology and its real application to the Nepalese natural handwriting. *Journal of Science*, 5(1), 31-55.
- Scholey, P. (2006). Development of cursive handwriting. *Journal of Computer*, 4(1), 312-318.
- Sherria, L. H., & Johanna, C. V. (2009). Motivation and ability: which student use online learning and what influence does it have on their achievement?. *Journal of Educational Technology*, 36(2), 177-192.
- Shneiderman, B. (2008). Designing user interface. *Journal of Computer Education*, 4, 123-130.
- Sullivan, B. (2000). When kids use the web: a naturalistic comparison of children navigation behavior and subjective preference on two WWW sites, *Proceeding of the 6th Conference on Human Factors and the Web*, Cambridge University.

- Tanner, S. (2007). Deciding whether optical character recognition is flexible: King's digital consultancy service. *Journal of Computer Education*, 7, 211-217.
- Tony, N. (2006). Requirement for the design of a Web page. *Journal of Computer Interaction*, 5, 155-172.
- Wixon, D. (1998). How to design usable system. In M. Helander, Ed., *Handbook of Human-Computer Interaction*. North-Holland: McGraw Hill
- Zeynel, A. M. (2009). Website for children. *Journal of Computer Education and Instructional*, 1183-1186.