

**POTENTIALS OF INTERACTIVE DIGITAL STORYTELLING
FOR PRESCHOOL CHILDREN IN DAILY READING ACTIVITY**

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**UNIVERSITI UTARA MALAYSIA
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**POTENTIALS OF INTERACTIVE DIGITAL STORYTELLING FOR
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partial Fulfillment of the requirement for the degree
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ABSTRAK

Kajian ini bertujuan untuk mengenal pasti potensi-potensi dari penceritaan digital interaktif atau *interactive digital storytelling* (DST) untuk peringkat kanak-kanak prasekolah dalam pembelajaran membaca harian mereka di darjah sekolah. Kajian ini dimulakan dengan membuat analisis prasyarat (*requirement analysis*) untuk menentukan komponen-komponen yang mesti ada dalam satu DST. Dua kaedah telah digunakan untuk tujuan tersebut yakni kaedah temubual dan analisis komparatif. Komponen-komponen yang telah ditentukan tersebut kemudian digunakan untuk membina sebuah prototaip (*prototype*). Dalam kajian ini, pembinaan prototaip mengikut kaedah yang diambil dari *IntView courseware development methodology*. Ada dua fasa dalam kaedah IntView iaitu: fasa prapembinaan dan fasa pembinaan. Ekperimen penggunaan prototaip ini kemudian dijalankan terhadap kanak-kanak prasekolah yang terlibat dalam kajian ini iaitu pelajar-pelajar yang berumur 6 tahun dari sekolah PPKKTPIS-UUM. Pengamatan dilakukan selama eksperimen dijalankan dan temubual dijalankan setelahnya untuk mengukur potensi-potensi dari DST yang diuji. Pengamatan (*observation*) dibahagi kepada dua peringkat iaitu pengamatan perilaku kanak-kanak prasekolah dalam darjah tanpa DST dan pengamatan ketika ada DST. Hasil kajian menunjukkan DST untuk prasekolah ini mampu menarik minat kanak-kanak dan membuat mereka terlibat secara aktif dalam process pembelajaran tersebut. Kanak-kanak juga menunjukkan keceriaan mereka ketika menggunakan DST dan memperlihatkan semangat belajar yang tinggi ketika menggunakan DST. Kajian ini juga mendapati bahawa kanak-kanak prasekolah lebih menyukai DST berbanding buku-buku cerita bercetak. Dapatan kajian ini menyimpulkan sejumlah potensi dari DST yang dapat digunakan dalam menciptakan cara pembelajaran dan pengajaran yang lebih berkesan pada peringkat prasekolah.

ABSTRACT

The purpose of this study is to discover the potentials of interactive digital storytelling (DST) of preschool children in daily reading activity. This study starts with requirement analysis to determine the components of the Preschool DST. Two techniques were used in this phase namely interview and comparative analysis. The discovered components were then used to develop a prototype. In this study, the development of Preschool DST prototype followed and was adapted from the IntView courseware development methodology. There are two phases in IntView; pre-development phase and development phase. User testing was carried out after the Preschool DST prototype was completed and the evaluation was then conducted through observations and interviews. The subject of this study was a group of 6 year-old preschool children from PPKKTPIS-UUM. The observation was divided into two activities: observation of the activities without the Preschool DST and observation of the activities with the Preschool DST where the children are observed when they were using the Preschool DST. The observation without Preschool DST was carried out in the morning session while the observation with Preschool DST was in the afternoon. The interview was then carried out after both observations were done. The finding shows that the Preschool DST is able to grab children's interest and engaging them during the learning process. The children show their enjoyment with Preschool DST and demonstrate their enthusiasm to use the DST. The study also found that the preschool children prefer the DST than printed storybooks. The finding leads to a number of potentials of the DST that will create more effective way in and enhance the teaching and learning activities in preschool level.

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LIST OF ABBREVIATIONS

DST	Digital Storytelling
ICT	Information and Communication Technology
MOSTI	Ministry of Science, Technology, and Innovation
NITA	National Information Technology Agenda of Malaysia
NITC	National Information Technology Council of Malaysia
PPKKTPIS	Pusat Perkembangan Kanak-Kanak Tunku Puteri Intan Safinaz
RLM	Reality Learning Media
RM6	Rancangan Malaysia Ke-6 (The Sixth Malaysia Plan)
RM7	Rancangan Malaysia Ke-7 (The Seventh Malaysia Plan)
RM8	Rancangan Malaysia Ke-8 (The Eighth Malaysia Plan)
RM9	Rancangan Malaysia Ke-9 (The Ninth Malaysia Plan)
RM10	Rancangan Malaysia Ke-10 (The Tenth Malaysia Plan)
UUM	Universiti Utara Malaysia

CHAPTER 1

INTRODUCTION

1.1 Background

Education is an essential aspect in human life. People seek the knowledge and increase their competencies through education. As the result of the rapid change and innovation in technology especially in the field of Information and Communication Technology (ICT), education system is forced to meet and adapt with the latest change and trend in the field. Multimedia technology as a branch of ICT is playing an important role in making the education system more interesting, efficient, and successful (Hardaway & Will, 1997). In fact, multimedia technology has become a popular tool in teaching and learning for every level of education. It has successfully complemented the traditional way of teaching and learning by putting more concerns on interactive aspects of education. In relation, interactive multimedia is basically employed to increase interactivity between student and teacher during the teaching-learning process using more than one media and at the same time, it might increase students' comprehensive understanding of the materials learned (Zurina, 2006).

The term 'interactive multimedia' is a catch-all phrase to describe a wave of computer software that primarily deals with the provision of information. The 'multimedia' component is characterized by the presence of text, pictures, sound, animation and video (Chapman & Chapman, 2002); some or all of which are organized into some coherent program making everything seamless (Faridah & Halimah, 2008). Meanwhile, the 'interactive' component refers to the process of empowering the user to control the environment usually by computer (Phillips, 1997; Jones & Jo, 1998; Chorianopoulos & Lekakos, 2007). In addition to its extensive use at higher learning institutions, as well as at primary and secondary learning education

The contents of
the thesis is for
internal user
only

REFERENCES

Allen, M. W. (2003). *Michael Allen's guide to e-learning: building interactive, fun, and effective learning programs for any company*. New Jersey: John Wiley and Sons.

Ariffin Abdul Mutalib. (2009). *Conceptual design of reality learning media (RLM) model based on fun and entertaining constructs*. Unpublished doctoral dissertation. Universiti Utara Malaysia, Sintok.

Ariffin Abdul Mutalib. (2010). Digital storytelling: An easy-to-create usable information conveyor. *Journal of Information Technology Review*, 1(1), 34-41.

Ariffin Abdul Mutalib, & Faizah Maarof. (2010). Guidelines of assistive courseware (AC) for hearing impaired students. In *Proceedings of Knowledge Management International Conference 2010 held on 25-27 May 2010 in Kuala Terengganu, Malaysia*. ISI Thompson.

Ariffin Abdul Mutalib, & Massudi Mahmuddin. (2010). Student marketability: Enhancing software skills. *Issues in Informing Science and Information Technology*, 7, 413-422.

Ariffin Abdul Mutalib, & Norshuhada Shiratuddin. (2008). Usable but not entertaining eLearning materials. In C. Bonk et al. (Eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2008 held on 17 November 2008 in Las Vegas, USA* (pp. 11-19). Chesapeake, VA: AACE.

Ariffin Abdul Mutalib, & Norshuhada Shiratuddin. (2009). Conceptual design model of Reality Learning Media (RLM). In *Proceedings of IADIS International Conference e-Society 2009*, Barcelona, Spain: IADIS.

Baloian, N., Berges, A., Buschmann, S., Gaßner, K., Hardings, J., Hoppe, H.U., et al. (2002). Document management in a computer integrated classroom. In Haake M. J. & Pino A. J. (Eds.), *Lectures Notes in Computer Science: Proceedings of the 8th International Workshop on Groupware CRIWG 2002*, (pp 351-358). London: Springer.

Beaty, J. J. (1994). *Picture book storytelling: Literature activities for young children*. Florida: Harcourt Brace College.

Bitwell, N. J., Reitmaier, T., Marsden, J., & Hansen, S. (2010). Designing with mobile digital storytelling in rural Africa. In *Proceedings of the 28th International Conference on Human Factors in Computing Systems held on 10-15 April 2010* (pp. 1593-1602), Atlanta, USA: ACM. Retrieved 17 September 2010, from ACM Portal database.

Bonwell, C. C., & Eison, J. A. (September 1991). *Active learning: Creating excitement in the classroom*. Retrieved 27 September 2010, from <http://www.eric.ed.gov.eserv.uum.edu.my/PDFS/ED340272.pdf>.

Cambridge Advanced Learner's Dictionary. (2003). Cambridge: Cambridge University Press.

Cennamo, K. S. (1993). Learning from video: factors influencing learners' preconceptions and invested mental effort. *Educational Technology Research and Development*, 41(3), 33-45.

Chorianopoulos, K. and Lekakos, G. (2007). Learn and play with interactive TV. *ACM Computers in Entertainment*, 5(2).

Chapman, N. & Chapman, J. (2002). *Digital media tools*. England: John Wiley & Sons, Ltd.

Churchill, N., Ping, L.C., Oakley, G. & Churchill, D. (2008). Digital storytelling and digital literacy learning. In *Proceedings of International Conference on Information Communication Technologies in Education (ICICTE) 2008* (pp: 418-430). Retrieved 26 September 2010, from <http://www.icicte.org/ICICTE%202008%20Proceedings/churchill043.pdf>

Cooper, A., Reinmann, R., & Cronin, D. (2007). *About Face 3: The essentials of interaction design*. Indianapolis: Wiley Publishing.

Dennis, A., Wixom, B. H., & Roth, R. M. (2006). *Systems analysis design* (3rd ed.). New Jersey: John Wiley & Sons, Inc.

Di Blas, N., Garzotto, F., Paolini, P. & Sabiescu, A. (2009). Digital storytelling as a whole-class learning activity: Lessons from a three-years project. In *Proceedings of ICIDS 2009 held on December 2009 in Guimarães, Portugal*, 5915, (pp. 14-25). Berlin, Heidelberg: Springer-Verlag.

Digital Storytelling Association. (2002). *Digital storytelling*. Retrieved on 6 March 2010, from <http://www.dsaweb.org/>.

Dix, A., Finlay, J., Abowd, G., & Beale, R. (2004). *Human computer interaction*. England: Prentice Hall International.

Driscoll, D. L., & Brizee, A. (2010). *Observing*. Retrieved 26 July 2010, from <http://owl.english.purdue.edu/owl/resource/559/07/>.

Evangelista, C., Neri, V., Bergamasco, M., & Carrozzino, M. (2009). Interactive storytelling for children education. Paper presented at *Games and Virtual Worlds for Serious Applications Conference*, 198-201. Retrieved 8 March 2010, from IEEE Xplore database.

Faridah Hanim Yahya, & Halimah Badioze Zaman. (2008). Development of interactive multimedia courseware using problem based learning in mathematics for Form 4. In *Proceedings of International Symposium on Information Technology*, 2. Kuala Lumpur: IEEE.

Feldmand, T. (1994). *Multimedia*. London: Chapman & Hall.

Garzotto, F., Paolo, P., & Sabiescu, A. (2010). Interactive storytelling for children. In *Proceedings of the 9th International Conference on Interaction Design and Children held on 9-12 June 2010 in Barcelona, Spain* (pp.356-359). New York: ACM. Retrieved 14 July 2010, from ACM Portal database.

Gils, F. V., (2005). Potential applications of digital storytelling in education. In *proceedings of 3rd Twente Student Conference on IT*. University of Twente.

Grützner, I., Niniek Angkasaputra, & Pfahl, D. (2002). A Systematic approach to produce small courseware modules for combined learning and knowledge management environments. In *Proceedings of the 14th International Conference on Software Engineering and Knowledge Engineering held on 15-19 July 2002 in Ischia, Italy* (pp. 533-539). New York: ACM. Retrieved 19 July 2010, from ACM Portal database.

Grützner, I., Pfahl, D. & Ruhe, G. (2002). Systematic courseware development using an integrated engineering style method. In *Proceedings of the World Congress Networked Learning in a Global Environment: Challenges and Solutions for Virtual Education*. Millet: ICSC-NAISO Academic Press.

Grützner, I., Weibelzahl, S. & Waterson, P. (2004). Improving courseware quality through lifecycle encompassing quality assurance. In *Proceedings of the*

2004 ACM Symposium on Applied Computing held on 14 March – 17 March 2004 in Nicocia, Cyprus (pp. 946-951). New York: ACM. Retrieved 24 July 2010, from ACM Portal database.

Hardaway, D., & Will, R. P. (1997). Digital multimedia offers key to educational reform. *Communication of the ACM*. 40 (4). 90-96. Retrieved 16 March 2010, from ACM Portal database.

Hohmann, M., & Weikart, D. P. (1995). *Educating young children: Active learning for practices for preschool and child care programs*. Michigan: High/Scope Press. Retrieved 8 April 2010, from <http://www.ecdgroup.com/download/gh1eycx1.pdf>.

Jones, V. and Jo J. H. (1998). Interactive multimedia based on learning theories to enhance tertiary education. In *Conference Proceedings ICCIMA'98*, Australia.

Kaplan, N., Chisik, Y., Knudtzon, K., Kulkarni, R., Moulthrop, S., Summers, K., et al. (2004). Supporting sociable literacy in the international children's digital library. In *Proceedings of Interaction Design and Children 2004*, 89-96.

Karat, C., Pinhanez, C., Karat, J., Arora, R., & Vergo, J. (2001). Less clicking, more watching: Results of the iterative design and evaluation of entertaining web experiences. In *Proceedings of Interact'2001*, Tokyo, Japan.

Karuović, D., & Radosav, D. (2009). Educational Software for Preschool Children. *Intelligent System and Informatics 2009. SISY '09*. 291-295. Retrieved 16 March 2010, from IEEE Xplore database.

Kendall, K. E., & Kendall, J. E. (2008). *Systems analysis and design* (7th ed.). New Jersey: Pearson Education, Inc.

Kruse, K. (2004). *The benefits and drawbacks of e-learning*. Retrieved 24 July 2010, from <http://labsel.pesarosviluppo.it/docindexer/Uploads%5C213-Beginner%20Basics.doc>.

Lewis, M. & Hayo, R. (2007). *Using Student-centered methods with teachers-centered students* (2nd Ed.). Toronto: Pippins Publishing.

Lim, Y. K., Stolterman, E., & Tenenberg, J. (2008). The anatomy of prototypes: Prototypes as filters, prototypes as manifestations of design ideas. *Transactions on Computer-Human Interaction (TOCHI)*, 15(2), 1-27. Retrieved 19 September 2010 from ACM Portal database.

Maddux, C., Johnson, D. & Willis, J. (2001). *Educational computer: Learning with tomorrow's technologies*. Boston: Allyn and Bacon.

Martin, M. (2007). Clickers in the classroom: An active learning approach. *EDUCAUSE Quarterly Magazine*. 30(2). Retrieved 9 April 2010, from <http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarter1>.

Matthew, K. (1997). A comparison of the influence of interactive CD-ROM storybooks and traditional print storybooks on reading comprehension. *Journal of Research on Computing in Education*, 29(3), 263-274. Retrieved 2 April 2010, from <http://archive.ifla.org/VII/s10/irayls/readint.htm>.

McGee, L. M., & Richgels, D. J. (2008). *Literacy's beginnings: supporting young readers and writers* (5th Ed.). Boston: Pearson education, Inc.

Meadows, D. (2003). Digital storytelling: Research-based practice in new media. *Visual Communication*, 2(2), 189-193.

Medwell, J. (1998). The talking books project: Some further insight into the use of talking books to develop reading, *Reading*, 32(1), 3-8. Retrieved 25 September 2010, from <http://onlinelibrary.wiley.com/doi/10.1111/1467-9345.00072/pdf>.

Ministry of Science, Technology, and Innovation. (2010). *Strategic ICT roadmap for Malaysia*. Retrieve 22 July 2010, from <http://www.mosti.gov.my>.

Munir. (n.d). *The effectiveness of multimedia in education package to motivate literacy (MEL) among preschool children*. Retrieved 12 August 2010, from <http://file.upi.edu/Direktori/D%20%20FPMIPA>.

Nielsen, J. (1993). *Usability engineering*. Boston: AP Professional.

Norhayati Abdul Mukti. (1999). *Perisian pengarangan*. Petaling Jaya: Prentice Hall.

Nurulnadwan Aziz, Nur-Hazwani Roseli, & Ariffin Abdul Mutalib. (2009). Guidelines for assistive courseware for visually-impaired people. In *Proceedings of IVIC'09*. LNCS 5857. Scopus: SpringerLink.

Pearman, C. (2008). Independent reading of CD-ROM storybook: Measuring comprehension by oral story retellings. *The Reading Teacher*, 61(8), 594-602. Retrieved 20 September 2010, from ERIC database.

Pearman, C., & Lefever-Davis, S. (2006). Supporting the essential elements with CD-ROM digital storytellings. *Reading Horizons Journal*, 46(4), 301-313. Retrieved 2 April 2010, from ERIC database.

Petty, G. (2004). *Active learning*. Retrieved 9 April 2010, from <http://www.geoffpetty.com/activelearning.html>.

Phillips, R. (1997). *The developer's handbook to interactive multimedia: A practical guide for educational developers*. London: Kogan Page.

Poole, D. A., & Lindsay, D. S. (1995). Interviewing preschoolers: Effects of nonsuggestive technique, parental coaching, and leading question on report of nonexperienced events. *Journal of Experimental Child Psychology*, 60, 129-154. Retrieved 24 September 2010, from <http://web.uvic.ca/psych/lindsay/publications/1995PooleLind.pdf>

Prasetio. (2010). *The benefit of storytelling*. Retrieved 24 August 2010, from <http://hubpages.com/hub/The-Benefit-Of-Storytelling-For-Children>.

Preece, J., Rogers, Y., & Sharp, H. (2007). *Interaction Design: beyond human-computer interaction* (2nd Ed.). England: John Wiley& Sons, Ltd.

Regan, M. & Sheppard, S. (1996). Interactive multimedia courseware and the hands-on experience: an assessment study. *Journal of engineering education*, 85(2), 123-131.

Robin, B. R. (2008). Digital storytelling: A powerful technology tool for the 21st century classroom. *Theory Into Practice*, 47(3), 220-228. Retrieved 20 September 2010, from <http://www.informaworld.com/smpp/content>.

Rohizani Yaakub & Hazri Jamil. (2009). *Panduan Bercerita untuk Prasekolah*. Kuala Lumpur: PTS Professional Publishing.

Rosenberg, M. J. (2006). *Beyond e-learning: approach and technologies to enhance organizational knowledge, learning, and performance*. San Fransisco: Pfeiffer.

Roussou, M. (2004). Learn by doing and learn through play: An exploration of interactivity in virtual environments for children. *ACM Computers in Entertainment*, 2(1), 1-23. Retrieved 14 July 2010, from ACM Portal database.

Shamir, A., Korat, O., & Barbi, N. (2008). The effects of CD-ROM storybook on low SES kindergarteners' emergent literacy as a function of learning context. *Computers and Education*, 51, 354-367. Retrieved 5 August 2010, from ACM Portal database.

Sharda, N. (2007). Authoring Educational Multimedia Content Using Learning Styles and Story Telling Principles. *Educational Multimedia and Multimedia*

EducationWorkshop '07, 93-102. Retrieved 16 March 2010, from ACM Portal database.

Sharifah Abu Salem. (2009). *Ibu, Ceritalah Lagi*. Shah Alam: Buku Prima Sdn Bhd.

Siew, P. H., & Norhayati Abdul Mukti. (2004). CITRA: Interactive multimedia package in moral education for primary school children. In *TENCON 2004 IEEE Region 10 Conference*, 2, 247-250. Retrieved 8 March 2010, from IEEE Xplore database.

Smith, R. M. (1983). *Learning how to learn: Applied theory for adults*. Buckingham: Open University Press.

Stemler, L. K. (1997). Educational characteristics of multimedia: A literature review. *Journal of Educational Multimedia and Hypermedia*, 6(3/4), 339-359. Retrieved 26 September 2010, from http://www.medvet.umontreal.ca/techno/eta6785/articles/Multimedia_design.PDF.

Toki, E. I., & Pange, J. (2010). E-learning activities for articulation in speech language therapy and learning for preschool children. *Procedia Social and Behavioral Sciences*, 2, 4274-4278. Retrieved 5 August 2010, from www.sciencedirect.com.

Valkenburg, P., & Janssen, S. (1999). What do children value in entertainment programs? A cross-cultural investigation. *Journal of Communication*, 49(1), 3-21. Retrieved 26 September 2010, from <http://onlinelibrary.wiley.com>.

Wahyu Agung Widjajanto, Lund, M. & Schelhowe, H. (2008). "Wayang authoring": A web-based authoring tool for visual storytelling for children. In *Proceedings of The 6th International Conference on Advances in Mobile Computing & Multimedia held in Linz, Austria* (pp. 464-467). New York: ACM.

Whitten, J. L., Bentley, L. D., & Dittman, K. C. (2001). *Systems analysis and design methods* (5th Ed.). New York: McGraw-Hill.

Zhang, D. (2003). Powering e-learning in the new millennium: An overview of e-learning and enabling technology. *Information Systems Frontier*, 5(2), 201-212. Retrieved 20 July 2010, from ACM Portal database.

Zhang, D., Zhao, J. L., Zhou, L. & Nunamaker, J. F. (2004). Can e-learning replace classroom learning?. *Communication of the ACM*, 47(5), 74-79. Retrieved 21 July 2010, from ACM Portal database.

Zurina Muda. (2006). Storytelling approach in multimedia courseware: An introduction to science for preschool education. *Information and Communication Technology ICCTA '06*, 2, 2991-2993. Retrieved 8 March 2010, from IEEE Xplore database.