

**e-Ludic Learning for Low ICT-Aware Areas:  
An Experiment in Tepeaca, Puebla, Mexico**

by

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## **ABSTRACT**

Knowledge is a pre-requisite for success in the Information Age. Societies that wish to achieve better economic outcomes for their populations need to provide better education first and foremost. Developed countries are investing in innovative methodologies and technologies to educate their populations, with positive results. However, while the acceptability and accessibility of Information Communication Technology in wealthy societies has aided its widespread adoption by the educational sector, low ICT-aware regions and nations are lagging behind in the educational digital divide. Correspondingly, while researchers in the developed world have focused on the benefits of incorporating engaging forms of ICT (such as games) into education, comparatively little research has been done on the impact of ICT in no-access regions.

This thesis is an attempt to fill that research void. It does so by proposing an engaging ICT model that was developed for, and tested in, a low-access region of Mexico. Fundamental to this model is the concept of e-Ludic learning, which seeks to deliver knowledge through the playful, engaging, and interactive environment characteristic of online gaming. The thesis experiment involved exposing primary students from the Juan Escutia Primary School in the regional town of Tepeaca, Mexico, to the e-Ludic learning program developed by the author. The experiment results answer the following research questions:

- Is e-Ludic learning an effective alternative educational tool?
- Does e-Ludic learning effectively increase ICT-awareness in low-technology environments?

The experiment results, processed using the data-analysis techniques of Analysis of covariance (ANCOVA) and effect sizes, confirmed that e-Ludic learning does represent an effective alternative educational tool and that it can be seen to effectively increase ICT-awareness in regions characterised by low levels of technology access.

The thesis also addresses e-Ludic learning's potential as an enabler of technological leapfrogs, whereby underdeveloped regions can bypass the industrial stage of economic development, with its associated costs and impracticalities, to become digital economic zones.

## Thesis Chapters

Chapter One defines learning as a communicative process and acknowledges the importance of knowledge and ICT both to the transformation of learning and to development in contemporary economies. Chapter Two outlines the concept of play encompassed in ludic approaches to learning, and introduces e-Ludic learning as powerful new educational tool that synthesises digital technology and ludic learning. Chapter Three charts the short history of this nascent learning approach and presents case studies of commercially-available e-Ludic software programs. Chapter Four addresses the plight of low ICT-aware areas and examines current international initiatives aimed at tackling the digital divide. The latter part of this chapter details the Digital Puebla initiative, its importance as a development tool for the Tepeaca region, and its diffusion through a theoretical framework. Chapter Five presents the methods and Chapter Six the results of the thesis experiment conducted with SICOM and Juan Escutia Primary School students in Tepeaca, Puebla, Mexico. The final chapter, Chapter Seven, discusses the research questions, answers, and implications.

## **DECLARATION**

This thesis is submitted to Bond University in fulfilment of the requirements of Doctor of Philosophy. I, Luis Carlos Dominguez, acknowledge that this research thesis, completed under the supervision of Dr. Jeffrey Brand, represents my own original work towards this research degree and contains no material which has been previously submitted for a degree or diploma at this University or any other institution, except where due acknowledgement is made.



Signature

Date            04/08/2009

The undersigned examiners certify that they have read this research thesis entitled

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Submitted by

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Degree of Doctor of Philosophy

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## **DEFINITION OF TERMS**

*e-Ludic learning:* Learning that takes place in an electronic and playful environment involving the delivery of a body of knowledge through electronic channels such as CD-ROM, Internet, and Intranet. E-Ludic learning is the convergence of play theory and electronic learning. E-Ludic learning is learning-theory neutral.

*ICT:* Forms of technology that are used to create, store, share, transmit, or exchange information. This broad definition of ICT includes technologies such as telephone, radio, television, video, DVD, satellite systems, computer, and network hardware and software. It also encompasses the equipment and services associated with these technologies, such as video conferencing and electronic mail (Roongta & Priyadarshini, 2007, p. 1).

*No-access region/area:* Regions and areas that have little access to ICT.

*Alternative educational tool:* Educational techniques and technologies that diverge from those found in conventional education.

*Digital divide:* The gap between communities with regular and effective access to ICT and those without this access. It refers to both the physical accessibility of this technology and competency in its use.

*ICT-aware*: A conscious competency in relation to information and communication technology.

It involves the accessibility, the knowledge, and the practical use of this technology.

*Digital literacy*: The convergence of computer and web literacy. Computer literacy refers to those terms and procedures required in the use of computers (Mayo, 2004). Web literacy refers to the degree of fluency in an online environment using a browser interface.

*Low-technology environment*: An Environment that utilises manual and rural technologies and is characterised by an absence of information and communication technology. International organisations like the United Nations Educational, Scientific and Cultural Organisation (UNESCO) support the development of low-technology environments, as these are seen to underpin human and social development at the most basic level.

*Digital puebla*: The Mexican state of Puebla's e-government initiative to provide ICT in the form of public computers and Internet access to the inhabitants of the State of Puebla.

*Content assimilation*: The process of knowledge acquisition through a channel. For the purpose of this thesis, the channel is the Internet via an e-Ludic environment.

*Targeted population*: A set of inhabitants in a geographical area. A targeted population is a demographic group chosen for a particular goal. In this thesis, Juan Escutia Primary School of Tepeaca, in the State of Puebla, Mexico, was the targeted population chosen to answer the research questions.