Proceedings

DIGITEL 2007

The First IEEE International Workshop
on Digital Game and Intelligent
Toy Enhanced Learning

26-28 March 2007
Jhongli, Taiwan

Sponsored by
IEEE Technical Committee on Learning Technology
IEEE Computer Society
National Science Council, Taiwan
Ministry of Education, Taiwan

Los Alamitos, California
Washington       •       Tokyo
Table of Contents

Preface ..................................................................................................................................................................... ix
DIGITEL 2007 Chairs .............................................................................................................................................. x
DIGITEL 2007 Program Committee ...................................................................................................................... xi
DIGITEL 2007 Secretariat .................................................................................................................................... xiii

Keynotes

Technology and the Work of Children .................................................................................................................. 3
Michael Eisenberg

Hard Fun: Cognition and Emotion at Play ............................................................................................................. 4
Clark Quinn

What Can Children Learn through Game-Based Learning Systems? ............................................................... 5
Masanori Sugimoto

Full Papers

EduBingo: Design of Multi-level Challenges of a Digital Classroom Game .......................................................... 11
Hery N.H. Cheng, Yi-Chan Deng, Sung-Bin Chang, and Tak-Wai Chan

The Design of Learning Environments Using Videogames in Formal Education ............................................... 19
Begoña Gros

Why Toys Shouldn't Work "Like Magic": Children's Technology and the Values of Construction and Control .... 25
Mark D. Gross and Michael Eisenberg

"Silhouette-Box": An Interactive Interface for Modeling and Direct Manipulation in Mixed Reality ................. 33
Daisaku Hayashi, Masayuki Takamura, Naoto Nakamura, and Michio Kobayashi

An Investigation of the Differences between Robot and Virtual Learning Companions’ Influences on Students’ Engagement .............................................................................................................. 41
Sheng-Hsi Hsu, Chih-Yueh Chen, Fei-Ching Chen, Yuan-Kai Wang, and Tak-Wai Chan

Pedagogical Agents for Teacher Intervention in Educational Robotics Classes: Implementation Issues ........... 49
Ilkka Jormanainen, Yuejun Zhang, Kinshuk, and Erkki Sutinen
A Brief Survey of Distributed Computational Toys

Eric Schweikardt and Mark D Gross .................................................................57

A Pilot Study on Virtual Interactive Student-Oriented Learning Environment

Junjie Shang, Morris Siu Yung Fong, Fong Lok Lee, and Jimmy Ho Man Lee .................................................................65

Simulation-Based Game Learning Environments: Building and Sustaining a Fish Tank

Jason Tan and Gautam Biswas .....................................................................73

LEGO Robot Programming Exercise Support for Problem Solving Learning with Game Strategy Planning Tools

Hiroyuki Tominaga, Yohei Onishi, Toshihiro Hayashi, and Toshinori Yamasaki .................................................................81

AnswerMatching: A Competitive Learning Game with Uneven Chance Tactic

Winston M.C. Wu, Hery N.H. Cheng, Mong-Chen Chiang, Yi-Chan Deng, Chih-Yueh Chou, Chin-Chung Tsai, and Tak-Wai Chan .................................................................89

Short Papers

Implementation and Evaluation of EduBingo for Arithmetic Drill


My-Pet-and-Her-Friends: Identifying Educational Roles of Animal Companions in Game-Based Learning Environment

Zhi-Hong Chen, Calvin C. Y. Liao, and Tak-Wai Chan .................................................................104

Motivate AI Class with Interactive Computer Game

Akcell Chiang ..............................................................................................109

Effect of Computer-Based Video Games on Children: An Experimental Study

Tsung-Yen Chuang and Wei-Fan Chen .................................................................114

Functional Fun with Tangible User Interfaces

Willem Fontijn and Jettie Hoonhout ..............................................................................119

A Brief Review of Digital Games and Learning

Hui-Chun Hsiao ..............................................................................................124

Number Jigsaw Puzzle: A Mathematical Puzzle Game for Facilitating Players' Problem-Solving Strategies

Owen W.S. Huang, Hery N.H. Cheng, and Tak-Wai Chan .................................................................130

How Does an Online Game Based Learning Environment Promote Students' Intrinsic Motivation for Learning Natural Science and How Does It Affect Their Learning Outcomes?

Mei-Jen Kuo ..............................................................................................135

Reflections on the IT Aspects of Writing, Designing, and Producing Law Games - Online, CD-Rom, or DVD?

Tess Li and M. J. Le Brun ......................................................................................143

Digital Games: Developing the Issues of Socio-cognitive Learning Theory in an Attempt to Shift an Entertainment Gadget to an Educational Tool

Sophia Mysirlaki and Fotini Paraskeva ..............................................................................147
The Challenges of Deploying Educational Games in Hong Kong Schools: A Developer's Perspective
Frankie Yam and John Milton

Framework for Bloom’s Knowledge Placement in Computer Games
Cheng-Su Wang and Yeu-Ruey Tzeng

Posters

Chatterer Ping-Pong Table
Shigeki Doi, Yasuhiro Kawada, and Satoshi Fujii

Learn Programming by Using Mobile Edutainment Game Approach
Siti Hafizah Ab Hamid and Leong Yu Fung

Development and Experiment of a Game Based Learning Program for e-Money
Tadahiro Hata, Naoki Ushijima, Hiroyuki Hiraga, and Kenji Watanabe

Massively Multiplayer Online Game Supported Foreign Language Listening Ability Training
Michu M. Hu and Ben Chang

Idea Storming Cube: A Game-Based System to Support Creative Thinking
Chun-Chieh Huang, Tsai-Yen Li, Hao-Chuan Wang, and Chun-Yen Chang

Pokémon: Game Play as Multi-subject Learning Experience
Yu-Hong Lin

An Approach to a Virtual Learning Environment through a Game
Pasi Mattila, Jukka Miettunen, and Tony Manninen

Development of a Long-Distance-Controlled Robot System Using the Web for International Exchange
Akiyuki Minamide, Kazuya Takemata, Nobuyuki Naoe, and Pee Suat Hoon

Do Children Understand Binary Numbers by Electric Card Game?
Hiroyuki Mitsuhara, Hiroaki Ogata, Kazuhide Kanenishi, and Yoneo Yano

3-Dimensional Shape Capture Using Intelligent Blocks as Direct Modeling
Masahiro Ohno and Shigeki Doi

A New Game Device Using Body-Braille for Visually Impaired People
Satoshi Ohbuku, Nobuyuki Sasaki, Sadao Hategawa, and Tetsumi Harakawa

A Vision Based Interactive Billiard Ball Entertainment System
Chihhsiong Shih and William C. Chu

MuDiS - A Virtual Learning Environment
Jeetinder Singh, Jayanthi Sivaswamy, and Krishnarajulu Naidu

Shadow Box: An Interactive Learning Toy for Children
Ja-Young Sung, Aaron Levinson, Ji-won Song, Ben Tomassetti, and Ali Mazulek

An Approach to Utilize Ubiquitous Device for Game-Based Learning Environment
Takahiro Tachino, Yunuki Kato, and Shogo Kato

Designing Constructivist Learning Environment in Online Game
Fu-Hsing Tsai, Kuang-Chao Yu, and Hsien-Sheng Hsiao
Soccer RoBot Toy within an Educational Environment

Peter James Vial, Giancarlos Serafini, and Ibrahim Raad

PILE: Physical Interactive Learning Environment

Jie Chi Yang, Yi Ho Chen, and Chih Hung Chen

Design of Dyad Game for Developing Fluency in Multiplication Facts

Charles Y.C. Yeh, Calvin C.Y. Liao, Jen-Hang Wang, and Tak-Wai Chan

The Procedure Model and Implementation Technology of VE for Science Education

Ruwei Yun, Huimin Shi, Yi Li, and Zhigeng Pan

Author Index