

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**



DIGITEL 2007

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

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
<i>Michael Eisenberg</i>	
Hard Fun: Cognition and Emotion at Play	4
<i>Clark Quinn</i>	
What Can Children Learn through Game-Based Learning Systems?	5
<i>Masanori Sugimoto</i>	

Full Papers

EduBingo: Design of Multi-level Challenges of a Digital Classroom Game	11
<i>Hery N.H. Cheng, Yi-Chan Deng, Sung-Bin Chang, and Tak-Wai Chan</i>	
The Design of Learning Environments Using Videogames in Formal Education.....	19
<i>Begoña Gros</i>	
Why Toys Shouldn't Work "Like Magic": Children's Technology and the Values of Construction and Control.....	25
<i>Mark D. Gross and Michael Eisenberg</i>	
"Silhouette-Box": An Interactive Interface for Modeling and Direct Manipulation in Mixed Reality.....	33
<i>Daisaku Hayashi, Masayuki Takamura, Naoto Nakamura, and Michio Kobayashi</i>	
An Investigation of the Differences between Robot and Virtual Learning Companions' Influences on Students' Engagement.....	41
<i>Sheng-Hui Hsu, Chih-Yueh Chou, Fei-Ching Chen, Yuan-Kai Wang, and Tak-Wai Chan</i>	
Pedagogical Agents for Teacher Intervention in Educational Robotics Classes: Implementation Issues	49
<i>Ilkka Jormanainen, Yuejun Zhang, Kinsbuk, and Erkki Sutinen</i>	

A Brief Survey of Distributed Computational Toys.....	57
<i>Eric Schweikardt and Mark D Gross</i>	
A Pilot Study on Virtual Interactive Student-Oriented Learning Environment	65
<i>Junjie Shang, Morris Siu Yung Jong, Fong Lok Lee, and Jimmy Ho Man Lee</i>	
Simulation-Based Game Learning Environments: Building and Sustaining a Fish Tank.....	73
<i>Jason Tan and Gautam Biswas</i>	
LEGO Robot Programming Exercise Support for Problem Solving Learning with Game Strategy Planning Tools.....	81
<i>Hiroynuki Tominaga, Yobei Onishi, Toshibiro Hayashi, and Toshinori Yamasaki</i>	
AnswerMatching: A Competitive Learning Game with Uneven Chance Tactic.....	89
<i>Winston M.C. Wu, Hery N.H. Cheng, Mong-Chen Chiang, Yi-Chan Deng, Chih-Yueh Chou, Chin-Chung Tsai, and Tak-Wai Chan</i>	

Short Papers

Implementation and Evaluation of EduBingo for Arithmetic Drill	99
<i>Sung-Bin Chang, Yi-Chan Deng, Hery N. H. Cheng, Hui-Chun Liao, Fu-Yun Yu, and Tak-Wai Chan</i>	
My-Pet-and-Her-Friends: Identifying Educational Roles of Animal Companions in Game-Based Learning Environment	104
<i>Zhi-Hong Chen, Calvin C. Y. Liao, and Tak-Wai Chan</i>	
Motivate AI Class with Interactive Computer Game	109
<i>Akcell Chiang</i>	
Effect of Computer-Based Video Games on Children: An Experimental Study	114
<i>Tsung-Yen Chuang and Wei-Fan Chen</i>	
Functional Fun with Tangible User Interfaces	119
<i>Willem Fontijn and Jettie Hoonhout</i>	
A Brief Review of Digital Games and Learning	124
<i>Hui-Chun Hsiao</i>	
Number Jigsaw Puzzle: A Mathematical Puzzle Game for Facilitating Players' Problem- Solving Strategies	130
<i>Owen W.S. Huang, Hery N.H. Cheng, and Tak-Wai Chan</i>	
How Does an Online Game Based Learning Environment Promote Students' Intrinsic Motivation for Learning Natural Science and How Does It Affect Their Learning Outcomes?	135
<i>Mei-Jen Kuo</i>	
Reflections on the IT Aspects of Writing, Designing, and Producing Law Games - Online, CD-Rom, or DVD?	143
<i>Tess Li and M. J. Le Brun</i>	
Digital Games: Developing the Issues of Socio-cognitive Learning Theory in an Attempt to Shift an Entertainment Gadget to an Educational Tool.....	147
<i>Sofia Mysirlaki and Fotini Paraskeva</i>	

The Challenges of Deploying Educational Games in Hong Kong Schools: A Developer’s Perspective.....	152
<i>Frankie Tam and John Milton</i>	
Framework for Bloom’s Knowledge Placement in Computer Games.....	159
<i>Cheng-Su Wang and Yeu-Ruey Tzeng</i>	

Posters

Chatterer Ping-Pong Table	167
<i>Shigeaki Doi, Yasuhiro Kawada, and Satoshi Fujii</i>	
Learn Programming by Using Mobile Edutainment Game Approach.....	170
<i>Siti Hafizah Ab Hamid and Leong Yu Fung</i>	
Development and Experiment of a Game Based Learning Program for e-Money Literacy Education	173
<i>Tadabiro Hata, Naoki Ushijima, Hiroyuki Hiraga, and Kenzi Watanabe</i>	
Massively Multiplayer Online Game Supported Foreign Language Listening Ability Training.....	176
<i>Michu M. Hu and Ben Chang</i>	
Idea Storming Cube: A Game-Based System to Support Creative Thinking	179
<i>Chun-Chieh Huang, Tsai-Yen Li, Hao-Chuan Wang, and Chun-Yen Chang</i>	
Pokémon: Game Play as Multi-subject Learning Experience.....	182
<i>Yu-Hong Lin</i>	
An Approach to a Virtual Learning Environment through a Game	185
<i>Pasi Mattila, Jukka Miettunen, and Tony Manninen</i>	
Development of a Long-Distance-Controlled Robot System Using the Web for International Exchange.....	188
<i>Akiyuki Minamide, Kazuya Takemata, Nobuyuki Naoe, and Pee Suat Hoon</i>	
Do Children Understand Binary Numbers by Electric Card Game?.....	191
<i>Hiroyuki Mitsubara, Hiroaki Ogata, Kazuhide Kanenishi, and Yoneo Yano</i>	
3-Dimensional Shape Capture Using Intelligent Blocks as Direct Modeling	194
<i>Masabiro Ohno and Shigeaki Doi</i>	
A New Game Device Using Body-Braille for Visually Impaired People.....	197
<i>Satoshi Ohtsuka, Nobuyuki Sasaki, Sadao Hasegawa, and Tetsumi Harakawa</i>	
A Vision Based Interactive Billiard Ball Entertainment System.....	200
<i>Chibhsiong Shib and William C. Chu</i>	
MuDiS - A Virtual Learning Environment.....	203
<i>Jeetinder Singh, Jayanthi Sivaswamy, and Krishnarajulu Naidu</i>	
Shadow Box: An Interactive Learning Toy for Children	206
<i>Ja-Young Sung, Aaron Levisohn, Ji-won Song, Ben Tomassetti, and Ali Mazalek</i>	
An Approach to Utilize Ubiquitous Device for Game-Based Learning Environment.....	209
<i>Takashi Tachino, Yunki Kato, and Shogo Kato</i>	
Designing Constructivist Learning Environment in Online Game	212
<i>Fu-Hsing Tsai, Kuang-Chao Yu, and Hsien-Sheng Hsiao</i>	

Soccer RoBot Toy within an Educational Environment.....	215
<i>Peter James Vial, Giancarlo Serafini, and Ibrahim Raad</i>	
PILE: Physical Interactive Learning Environment	218
<i>Jie Chi Yang, Yi Ho Chen, and Chih Hung Chen</i>	
Design of Dyad Game for Developing Fluency in Multiplication Facts.....	221
<i>Charles Y.C. Yeh, Calvin C.Y. Liao, Jen-Hang Wang, and Tak-Wai Chan</i>	
The Procedure Model and Implementation Technology of VE for Science Education.....	224
<i>Ruwei Yun, Huimin Shi, Yi Li, and Zhiqiang Pan</i>	
Author Index	227