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**TECHNOLOGIES**

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# Preface

The International Conference on Advanced Learning Technologies (ICALT) is an annual conference organized by IEEE Computer Society and IEEE Technical Committee on Learning Technology. It aims to bring together people who are working on the design, development, use and evaluation of technologies that will be the foundation of the next generation of e-learning systems and technology-enhanced learning environments. After its kick-off as IWALT in Palmerston North, New Zealand (2000), ICALT has been held in Madison, USA (2001), Kazan, Russia (2002), Athens, Greece (2003), Joensuu, Finland (2004), Kaohsiung, Taiwan (2005), Kerkrade, The Netherlands (2006), Niigata, Japan (2007), Santander, Spain (2008), and Riga, Latvia (2009). The 10<sup>th</sup> IEEE International Conference on Advanced Learning Technologies (ICALT2010) is held in Sousse, Tunisia, a city with rich culture and a long-standing tradition in computer-based learning.

The main topic of interest in ICALT2010 were: Learning Systems Platforms and Architectures, Rethinking Pedagogy in Technology-enhanced Learning, Adaptive and Personalized Technology-enhanced Learning, Intelligent Educational Systems, Computer Supported Collaborative Learning, Wireless, Mobile and Ubiquitous Technologies for Learning, Ambient Intelligence and Smart Environments for Learning, Digital Game and Intelligent Toy Enhanced Learning, Web 2.0 and Social Computing for Learning and Knowledge Sharing, Semantic Web and Ontologies for Learning Systems, Affective and Pervasive Computing for Learning, Human-Centered Web Science and its Applications to Technology-enhanced Learning, Virtual Worlds for Academic, Organizational, and Life-Long Learning, e-Assessment and new Assessment Theories and Methodologies, Data Mining and Web Mining in Education, Knowledge and Competencies Management, Technology-Enhanced Language Learning, Advanced Learning Technologies for Disabled and Non-Disabled People, Technology-enhanced Science Education, International Alliance for Open Source, Open Standards, and federated repositories, School of the Future and Future Classrooms, and E-learning in the Workplace.

This year, the ICALT main conference received 302 papers from 48 countries (not counting the submissions received for various workshops). All submissions were peer-reviewed in a triple-blind review process by an international panel of at least three international expert referees and decisions were taken based on assessing research quality. We are very pleased to note that the quality of the submissions this year turned out to be very high. A total of 80 papers were accepted as full papers in the main ICALT conference, that is, a 26.49% acceptance rate. Furthermore, 81 papers were selected for presentation as short papers and 25 as posters.

We acknowledge the invaluable assistance of the program committee and the international referees, who are named on another page. Most reviewers opted to provide detailed comments to the authors, making it a valuable experience for the authors, even if their submission was not selected for the conference.

With all the effort that has gone into the process, by authors and reviewers, we are confident that this year's ICALT proceedings will immediately earn a place as an indispensable overview of the state of the art and will have significant archival value in the longer term.

**Mohamed Jemni**  
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# 2010 10th IEEE International Conference on Advanced Learning Technologies

## ICALT 2010

### Table of Contents

<b>Preface</b> .....	xxi
<b>Chairs / Committees</b> .....	xxii
<b>Reviewers</b> .....	xxv

---

#### 10th IEEE International Conference on Advanced Learning Technologies (ICALT 2010)

3D Digital Simulations in Participative Design of the Boulevard in Putrajaya: Implications on Academic, Organizational, and Informal Learning .....	1
<i>Rashidah Ab. Rahman</i>	
A 3D Educational Mobile Game to Enhance Student’s Spatial Skills .....	6
<i>Norena Martin-Dorta, Isabel Sanchez-Berriel, Miguel Bravo, Juan Hernandez, Jose Luis Saorin, and Manuel Contero</i>	
A Chorus Learning Support System Based on the Tutoring Knowledge of the Chorus Leader .....	11
<i>Mizue Kayama, Kazunori Itoh, Kazushi Asanuma, Masami Hashimoto, and Makoto Otani</i>	
A Collaborative Mobile Virtual Campus System Based on Location-Based Dynamic Grouping .....	16
<i>Qing Tan, Kinshuk, Yu-Lin Jeng, and Yueh-Min Huang</i>	
A Conceptual Framework of Learning through Agent Negotiation .....	19
<i>K. Robert Lai and Chung-Hsien Lan</i>	
A Design for Integration of Web 2.0 and an Online Learning Community: A Pilot Study for IWILL 2.0 .....	22
<i>I-Fan Liu, Meng Chang Chen, Yeali Sun, David Wible, and Chin-Hwa Kuo</i>	
A Diversity-Enhanced Genetic Algorithm to Characterize the Questions of a Competitive e-Learning System .....	25
<i>Elena Verdú, María Jesús Verdú, Luisa M. Regueras, and Juan Pablo de Castro</i>	

A Flexible Mechanism for Providing Adaptivity Based on Learning Styles in Learning Management Systems .....	30
<i>Sabine Graf, Kinshuk, and Cindy Ives</i>	
A Formative eAssessment Co-Design Case Study .....	35
<i>D.A. Bacigalupo, W.I. Warburton, E.A. Draffan, P. Zhang, L. Gilbert, and G.B. Wills</i>	
A Framework for Learning Through Mobile Qualitative Research .....	38
<i>Jorge Torres, César Cárdenas, Eduardo Juárez, Benjamín Valdés, and Juan Manuel Dodero</i>	
A Game Based Learning Content for Tutoring in Simplifying Boolean Functions .....	43
<i>Yong Suk Choi</i>	
A Mobile Learning System for Syndromic Surveillance and Diagnosis .....	48
<i>Jingyu Zhang, David Levy, and Shiping Chen</i>	
A New Approach Based on Modelled Traces to Compute Collaborative and Individual Indicators Human Interaction .....	53
<i>Tarek Djouad, Alain Mille, Christophe Reffay, and Mohammed Benmohammed</i>	
A Perspective on Listening Comprehension: How ICT Enable a Chinese as a Foreign Language (CFL) Learner to Achieve Learning Metacognition .....	55
<i>Mei Jen Audrey Shih and Jie Chi Yang</i>	
A Portal-Based Gradebook - DAG-Based Definition of Assessment Criteria in Higher Education .....	58
<i>Patrick Stalljohann and Ulrik Schroeder</i>	
A Preliminary Study on Learners Physiological Measurements in Educational Hypermedia .....	61
<i>Nikos Tsianos, Panagiotis Germanakos, Zacharias Lekkas, Anna Saliarou, Costas Mourlas, and George Samaras</i>	
A Proposal to Improve the Simple Query Interface (SQI) of Learning Objects Repositories .....	64
<i>Salvador Otón, José R. Hilera, Eva García, Antonio García, Luis de-Marcos, Antonio Ortiz, José A. Gutiérrez, José J. Martínez, José M. Gutiérrez, and Roberto Barchino</i>	
A Set of Software Tools to Build an Author Assessment Package on Moodle: Implementing the AEEA Proposal .....	67
<i>Beatriz E. Florián G., Silvia M. Baldiris, Ramón Fabregat, and Alexis De la Hoz Manotas</i>	
A Social Network Analysis Perspective on Student Interaction within the Twitter Microblogging Environment .....	70
<i>Karen Stepanyan, Kerstin Borau, and Carsten Ullrich</i>	
A Trace-Based Learner Modelling Framework for Technology-Enhanced Learning Systems .....	73
<i>Lemya Settouti, Nathalie Guin, Alain Mille, and Vanda Luengo</i>	

Active Sharing of Contextual Learning Experiences among Users in Personal Learning Environments Using a Peer-to-Peer Network .....	78
<i>Amel Bouzeghoub and Ngoc-Kien Do</i>	
ALGOWEB: A Web-Based Environment for Learning Introductory Programming .....	83
<i>Ricardo Vargas Dorneles, Delcino Picinin Jr., and André Gustavo Adami</i>	
An Adaptive Method for Selecting Question Pools Using C4.5 .....	86
<i>Ahmad Mustafa Seet and Imran A. Zualkernan</i>	
An Approach for the Personalization of Exercises Based on Contextualized Attention Metadata and Semantic Web technologies .....	89
<i>Pedro J. Muñoz-Merino, Carlos Delgado Kloos, Martin Wolpers, Martin Friedrich, and Mario Muñoz-Organero</i>	
An Architecture for Layering and Integration of Learning Ontologies, Applied to Personal Learning Environments and Cloud Learning Environments .....	92
<i>Alexander Mikroyannidis, Paul Lefrere, and Peter Scott</i>	
An Audio Book Platform for Early EFL Oral Reading Fluency .....	94
<i>Kuo-Ping Liu, Cheng-Chung Liu, Chih-Hsin Huang, Kuo-Chun Hung, and Chia-Jung Chang</i>	
An Educational Environment for Training Skills for Global Software Development .....	99
<i>Miguel J. Monasor, Aurora Vizcaino, and Mario Piattini</i>	
An Evaluation of Diagnosis in a Learning Environment for Object-Oriented Modeling .....	102
<i>Ludovic Auxepaules and Dominique Py</i>	
An Integrated Approach to Learning Object Sequencing .....	105
<i>Battur Tugsergel, Rachid Anane, and Georgios Theodoropoulos</i>	
An Integrated Model of Synchronous Cyber Assessment and Blended Learning Environment for Foreign Language Learners .....	110
<i>Sabrina Leone, Tommaso Leo, and Nian-Shing Chen</i>	
An Investigation of the Enhancement and the Formal Description of IMS/QTI Specification for Programming Courses .....	113
<i>Ahlem Harchay, Lilia Cheniti-Belcadhi, and Rafik Braham</i>	
An Online Arabic Learning Environment Based on IMS-QTI .....	116
<i>Abdelkader Abdelkarim, Dalila Souilem Boumisa, and Rafik Braham</i>	
An Online Collaborative Learning Platform with Annotation on Figures .....	119
<i>Ping-Lin Fan, Hsueh-Wu Wang, Wei-Hsien Wu, Su-ju Lu, Min-Chung Ke, and Han-Jang Wu</i>	
Analysis of the Advantages of Using Tablet PC in e-Learning .....	122
<i>Masahiro Ando and Maomi Ueno</i>	

Analyzing Contextualized Attention Metadata with Rough Set Methodologies to Support Self-regulated Learning .....	125
<i>Maren Scheffel, Martin Wolpers, and Frank Beer</i>	
Applying and Reusing Knowledge in a Repository .....	130
<i>I. Azevedo, A. Ortiz, C. Vaz de Carvalho, Rui Seça, and E. Carrapatoso</i>	
AR_Dehaes: An Educational Toolkit Based on Augmented Reality Technology for Learning Engineering Graphics .....	133
<i>Jorge Martín-Gutiérrez, Jose Luis Saorín, Manuel Contero, and Mariano Alcañiz</i>	
ASK-LOM-AP: A Web-Based Tool for Development and Management of IEEE LOM Application Profiles .....	138
<i>George Chloros, Panagiotis Zervas, and Demetrios G. Sampson</i>	
Automarking: Automatic Assessment of Open Questions .....	143
<i>Laurie Ane Cutrone and Maiga Chang</i>	
Bringing the Social Semantic Web to the Personal Learning Environment .....	148
<i>Vlad Posea and Stefan Trausan-Matu</i>	
Browsing E-Lecture Libraries on Mobile Devices: A Spatial Interaction Concept .....	151
<i>Jochen Huber, Jürgen Steimle, Simon Olberding, Roman Lissermann, and Max Mühlhäuser</i>	
CARDS: A Metamodel Approach to Aggregate Outcomes of Learning Tools .....	156
<i>Emilio Julio Lorenzo and María Felisa Verdejo</i>	
Case-Based Medical E-assessment System .....	158
<i>Rozemary Scarlat, Liana Stanescu, Elvira Popescu, and Dumitru Dan Burdescu</i>	
Checking Semantic Consistency of SCORM like Learning Objects .....	163
<i>Ramzi Farhat, Bruno Defude, and Mohamed Jemni</i>	
Children’s Interactive Behavior and Strategy in a Multi-robots’ Collaborative Environment .....	168
<i>Wu-Yuin Hwang, Sheng-Yi Wu, and Te-Yuan Yang</i>	
Collaborative Development of an Augmented Reality Application for Digestive and Circulatory Systems Teaching .....	173
<i>David Pérez-López, Manuel Contero, and Marianno Alcañiz</i>	
Combining Dialogue and Semantics for Learning and Knowledge Maturing: Developing Collaborative Understanding in the Web 2.0 Workplace .....	176
<i>Andrew Ravenscroft, Simone Braun, and Tobias Nelkner</i>	
Communication Patterns in Component-Based Intelligent Tutoring Systems .....	181
<i>Géraldine Ruddeck and Alke Martens</i>	
Comparing Social Virtual Worlds for Educational Purposes .....	186
<i>Rosa Reis, Paula Escudeiro, and Nuno Escudeiro</i>	
Computerized Adaptive Testing Based on Decision Tree .....	191
<i>Maomi Ueno and Pokpong Songmuang</i>	

Continuous Use of Authoring for Adaptive Educational Hypermedia: A Long-term Case Study .....	194
<i>Jonathan G.K. Foss, Alexandra I. Cristea, and Maurice Hendrix</i>	
Course Ranking and Automated Suggestions through Web Mining .....	197
<i>Stavros Valsamidis, Ioannis Kazanidis, Sotirios Kontogiannis, and Alexandros Karakos</i>	
Deepthink: A Second Life Environment for Part-time Research Students at a Distance .....	200
<i>L. Rapanotti, L. Barroca, M. Vargas-Vera, and A.J. Reeves</i>	
Design and Evaluation of an Affective Interface of the E-learning Systems .....	202
<i>Hui-Chun Chuang, Chin-Yeh Wang, Gwo-Dong Chen, Chen-Chung Liu, and Baw-Jhiune Liu</i>	
Design for Off-task Interaction - Rethinking Pedagogy in Technology Enhanced Learning .....	204
<i>Agneta Gulz, Annika Silvervarg, and Björn Sjöden</i>	
Design Study of OER-CC Ontology - A Semantic Web Approach to Describe Open Educational Resources .....	207
<i>Nelson Piedra, Janneth Chicaiza, Jorge López, Edmundo Tovar, and Oscar Martínez</i>	
Designing a Collaborative Learning Activity in Second Life - An Exploratory Study in Physics .....	210
<i>Ioannis Vrellis, Nikiforos M. Papachristos, Joan Bellou, Nikolaos Avouris, and Tassos A. Mikropoulos</i>	
Designing Game-Based Learning Framework - A Motivation-Driven Approach .....	215
<i>Kuo-chen Li, Jia-Chi Huang, Jia-Sheng Heh, Cheng-Ting Chen, Hui-Chih Wang, and Shiou-Wen Yeh</i>	
Designing Tutoring Activity - An Extension of Two EMLs, Based on an Organizational Model of Tutoring .....	217
<i>Patricia Gounon and Pascal Leroux</i>	
Developing a Collaborative E-Learning Environment Based upon Semantic Wiki: From Design Models to Application Scenarios .....	222
<i>Yanyan Li, Mingkai Dong, and Ronghuai Huang</i>	
Development and Evaluation of Learning Support System Based on Automatic Classification of Students' Programs According to Difference from Standard Algorithm .....	227
<i>Satoru Kogure, Hiroyasu Takatsu, Tatsuhiro Konishi, and Yukihiro Itoh</i>	
Digital Design Learning Patterns in Ambient Learning Environments .....	229
<i>Yacine Atif</i>	
dinsEditor: A Browser Extension for QTI-Compliant Assessment Item Authoring .....	231
<i>Sungjae Han, Jinjoo Kim, Youngseok Lee, Jaehyuk Cha, and Byung-Uk Choi</i>	

Educational Tool Based on Topology and Evolution of Hyperlinks in the Wikipedia .....	233
<i>Lauri Lahti</i>	
Educational Webportals Augmented by Mobile Devices with iFrimousse Architecture .....	236
<i>Florent Carlier and Valérie Renault</i>	
Effects of Adaptive Reflection Teaching Strategies on Learners' Reflection Levels in a Web-Based Learning Environment .....	241
<i>Nian-Shing Chen, Chun-Wang Wei, and Chia-Chi Liu</i>	
E-learning Authoring with Docbook and SMIL .....	246
<i>Alberto González Téllez</i>	
Emotional Strategies for Vocabulary Learning .....	249
<i>Ramla Ghali and Claude Frasson</i>	
Enabling Communication and Feedback in Mass Lectures .....	254
<i>Mostafa Akbari, Georg Böhm, and Ulrik Schroeder</i>	
Enabling the Use of Real World Objects to Improve Learning .....	259
<i>Katja Niemann and Martin Wolpers</i>	
Engineering of Open Learning Scenarios - The Case of Hop3x Learning Scenarios .....	264
<i>El Amine Ouraiba, Christophe Choquet, Philippe Cottier, Christophe Despres, and Pierre Jacoboni</i>	
Enhancing Educational Metadata with Mobile Assisted Language Learning Information .....	269
<i>Panagiotis Zervas and Demetrios G. Sampson</i>	
Enhancing the Learning Experience by Addressing the Needs of the Learner Through Customization and Personalization in the Learning by Doing Methodology .....	274
<i>Surya Kiran Reddy K. and Sandhya Kode</i>	
Evaluating a Brain-Computer Interface to Categorise Human Emotional Response .....	276
<i>Katie Crowley, Aidan Sliney, Ian Pitt, and Dave Murphy</i>	
Evaluating Student Response Driven Feedback in a Programming Course .....	279
<i>José Luis Fernández Alemán, Dominic Palmer-Brown, and Chrisina Draganova</i>	
Evaluating the Effectiveness and Motivational Impact of Replacing a Human Instructor by Mobile Devices for Teaching Network Services Configuration to Telecommunication Engineering Students .....	284
<i>Mario Muñoz-Organero, Gustavo Ramirez-Gonzalez, Pedro J. Muñoz-Merino, and Carlos Delgado Kloos</i>	
Examining Learning Object Repositories from a Knowledge Management Perspective .....	289
<i>Pavlos Kallonis and Demetrios G. Sampson</i>	

Examining the Effects of the Simultaneous Display of Students' Responses Using a Digital Pen System on Class Activity - A Case Study of an Early Elementary School in Japan .....	294
<i>Taro Sugihara, Takumi Miura, Motoki Miura, and Susumu Kunifuji</i>	
Exploiting Semantic and Social Technologies for Competency Management .....	297
<i>Giovanni Acampora, Matteo Gaeta, Francesco Orciuoli, and Pierluigi Ritrovato</i>	
Exploiting the Semantic Web for Interactive Relationship Discovery in Technology Enhanced Learning .....	302
<i>Steffen Lohmann, Philipp Heim, and Paloma Díaz</i>	
Exploring the Development of Adaptable Learning Objects. A Practical Approach .....	307
<i>Voula Gkatzidou and Elaine Pearson</i>	
Extending LMS with Collaborative Remote Lab Features .....	310
<i>Mario A. Bochicchio and Antonella Longo</i>	
Extending Open Space Technology for Blended Learning .....	315
<i>Isabel Pereira and Antonio Dias Figueiredo</i>	
Extending the IMS LD standard with Adaptability .....	320
<i>Valérie Monfort, Maha Khemaja, and Slimane Hammoudi</i>	
Facilitating Learning Interests Through Mobile Information Visualization .....	323
<i>Yuan Xun Gu, Raymond Koon Chuan Koh, Vivian Hsueh-Hua Chen, and Henry Been-Lirn Duh</i>	
Fade-out and Peer Monitor Techniques in Tools for Scripted Argumentation: Evaluation Results from a Case Study .....	328
<i>Yannis N. Bouyias, Stavros N. Demetriadis, and Anastasios Karakostas</i>	
From a Personal Learning Environment to an Adaptable Personal Learning Environment: Meeting the Needs and Preferences of Disabled Learners .....	333
<i>Elaine Pearson, Voula Gkatzidou, and Steve Green</i>	
From Mini Rover Programs to Algebraic Expressions .....	336
<i>G. Barbara Demo</i>	
Helping Students Understand Courses through Written Syntheses: An LSA-Based Online Advisor .....	341
<i>Emmanuelle Villiot-Leclercq, Sonia Mandin, Philippe Dessus, and Virginie Zampa</i>	
How to Instrument a Community of Practice Dedicated to Project Based Pedagogy Tutors: A Solution Based on Case Based Reasoning .....	344
<i>Céline Quénu-Joiron and Dominique Lecllet</i>	
How to See Training Paths in Learning Management Systems? .....	349
<i>Philippe Teutsch and Jean-Francois Bourdet</i>	
iCALT: Intelligent Context-Aware Learning and Teaching Environment .....	352
<i>Shonali Krishnaswamy, Selby Markham, John Hurst, Steven Cunningham, Cyrill Labbe, Behrang Saeedzadeh, and Brett Gillick</i>	

Identifying Animals with Dynamic Location-aware and Semantic Hierarchy-Based Image Browsing for Different Cognitive Style Learners .....	355
<i>Dunwei Wen, Ming-Chi Liu, Yueh-Min Huang, Kinshuk, and Pi-Hsia Hung</i>	
Implementation of a Remote Analog and Digital Communications Laboratory for e-Learning .....	360
<i>Akram Abu-aisheh and Farid Farahmand</i>	
Implementation of Web-Based Dynamic Assessment System and its Application on Science Learning .....	362
<i>Ah-Fur Lai, Chih-Hung Chen, and Horng-Yih Lai</i>	
Implementing Psychological Parameters in a Web-Based Appraisal System .....	365
<i>Zacharias Lekkas, Nikos Tsianos, Costas Mourlas, Panagiotis Germanakos, and George Samaras</i>	
Improve the Output from a MCQ Test Item Generator Using Statistical NLP .....	368
<i>Robert Michael Foster</i>	
Increasing Motivation in a Multicultural Learning Setting .....	370
<i>S. Ortiz de Arri, M. Retegi, I. Calvo, A. Arruarte, J.A. Elorriaga, M. Larrañaga, and U. Rueda</i>	
Increasing Students In-Class Engagement through Public Commenting: An Exploratory Study .....	373
<i>Honglu Du, Hao Jiang, Mary Beth Rosson, and John M. Carroll</i>	
Indicators for Supporting the Regulation Process of Learners' Activities and the Teachers' Self-regulation Process .....	378
<i>Aina Lekira, Christophe Després, and Pierre Jacoboni</i>	
Injecting Pedagogical Constraints into Sequential Learning Pattern Mining .....	380
<i>Mingming Zhou and Yabo Xu</i>	
Instant Seat Mapping for Student Note Sharing Process .....	382
<i>Motoki Miura, Taro Sugihara, and Susumu Kunifuji</i>	
Integration of External Tools in Virtual Learning Environments: Main Design Issues and Alternatives .....	384
<i>Carlos Alario-Hoyos, Juan I. Asensio-Pérez, Miguel L. Bote-Lorenzo, Eduardo Gómez-Sánchez, Guillermo Vega-Gorgojo, and Adolfo Ruiz-Calleja</i>	
Interactive Search Interfaces for Young Children - The PuppyIR Approach .....	389
<i>Andreas Lingnau, Ian Ruthven, Monica Landoni, and Frans van der Sluis</i>	
Interactive Widgets for Regulation in Learning Games .....	391
<i>Thibault Carron, Jean-Charles Marty, and Stéphane Talbot</i>	
Inter-University Co-operation by Using ViCaDiS Virtual Campus .....	394
<i>Radu Vasiliu and Diana Andone</i>	
Introducing Students to Aerospace Board Information Systems Using an Embedded Graphics System Simulator .....	397
<i>Pavel Paces and Martin Šipos</i>	



Kernel for a Semantic Learning Platform with Adapted Suggestions .....	400
<i>Ioan Szilagyi, Radu Balog-Crisan, and Ioan Roxin</i>	
Lab VIEW-Based Integrated Virtual Learning Platform .....	403
<i>Akram Abu-aisheh and Farid Farahmand</i>	
Learner Control on Feedback: A New Extension to Adaptive Learning? .....	406
<i>Mieke Vandewaetere and Kelly Wauters</i>	
Learning Biology with the Animated Agent in Game Based Learning Environment .....	409
<i>Hsin I Yung</i>	
Learning by Pet-training Competition: Alleviating Negative Influences of Direction Competition by Training Pets to Compete in Game-Based Environments .....	411
<i>Zhi-Hong Chen, Calvin C.Y. Liao, and Tak-Wai Chan</i>	
Learning Styles and Teaching Strategies to Improve the SCORM Learning Objects Quality .....	414
<i>Javier Enrique Rojas Moreno and Bruno Defude</i>	
Learning Technology Standards Adoption Process Improvement and Output Legitimacy .....	417
<i>Paul A. Hollins and Tore Hoel</i>	
Learning Words Using Augmented Reality .....	422
<i>Carmen M. Juan, Edith Llop, Francisco Abad, and Javier Lluch</i>	
Managing the Production and Evolution of e-learning Tools with Attribute Grammars .....	427
<i>Bryan Temprado-Battad, Antonio Sarasa-Cabezuelo, and José Luis Sierra</i>	
Model-Driven Development of Context-aware Adaptive Learning Systems .....	432
<i>Jihen Malek, Mona Laroussi, Alain Derycke, and Henda Ben Ghezala</i>	
Modeling Adaptive Situations According with Context and Learning Scenarios .....	435
<i>Ana Marilza Pernas, José Palazzo M. de Oliveira, and Amel Bouzeghoub</i>	
Modelling Affect in Learning Environments - Motivation and Methods .....	438
<i>Shazia Afzal and Peter Robinson</i>	
Modelling Computer Game Based Educational Experience for Teaching Children about Emergencies .....	443
<i>Mario Rafael Ruiz Vargas, Telmo Zorraonandia, Paloma Díaz, and Ignacio Aedo</i>	
Monitoring Learning Experiences and Styles: The Socio-emotional Level .....	445
<i>Chiara Spadavecchia and Carlo Giovannella</i>	
Multi-Object Oriented Augmented Reality for Location-Based Adaptive Mobile Learning .....	450
<i>William Chang, Qing Tan, and Fang Wei Tao</i>	
Multiple Usability Evaluations of a Program Animation Tool .....	452
<i>Antonio Pérez Carrasco, J. Ángel Velázquez Iturbide, and Jaime Urquiza Fuentes</i>	

Multi-User 3D Virtual Environment for Spanish Learning: A Wonderland Experience .....	455
<i>María Blanca Ibáñez, José Jesús García, Sergio Galán, David Maroto, Diego Morillo, and Carlos Delgado Kloos</i>	
Offering Early Success Experiences in Software Construction: Experiences Teaching Dynamic Website Development to High School Girls .....	458
<i>Mary Beth Rosson, Hansa Sinha, Tisha Hansford, and Jan Mahar</i>	
On Improving Learning Outcomes Through Sharing of Learning Experiences .....	461
<i>Au Thien Wan, Shazia Sadiq, and Xue Li</i>	
On the Design of Learning Objects Classifiers .....	464
<i>Marcelo Mendoza and Carlos Becerra</i>	
Ontology-Based Solution for Personalized Recommendations in E-Learning Systems. Methodological Aspects and Evaluation Criterias .....	469
<i>Mihaela Brut and Florence Sèdes</i>	
OPENET4VE: A Platform for the Execution of IMS LD Units of Learning in Virtual Environments .....	472
<i>Beatriz Fernández-Gallego, Manuel Lama, Juan Carlos Vidal, Eduardo Sánchez, and Alberto Bugarín</i>	
Pedagogical Deigns and Principles in Vocational Training: The Case of ELEVATE .....	475
<i>Iraklis Paraskakis, Andreas Konstantinidis, and Ikaros Tsantekidis</i>	
Perceptions and Illusions about Adaptivity and Their Effects on Learning Outcomes .....	480
<i>Mieke Vandewaetere and Geraldine Clarebout</i>	
Personalized Game Based Mobile Learning to Assist High School Students with Mathematics .....	485
<i>Vani Kalloo, Kinshuk, and Permanand Mohan</i>	
Personalizing Learning Processes by Data Mining .....	488
<i>Rainer Knauf, Yoshitaka Sakurai, Kohei Takada, and Setsuo Tsuruta</i>	
Playing Games on the Screen: Adapting Mouse Interaction at Early Ages .....	493
<i>J. Enrique Agudo, Héctor Sánchez, and Mercedes Rico</i>	
Prediction of Players Motivational States Using Electrophysiological Measures during Serious Game Play .....	498
<i>Lotfi Derbali and Claude Frasson</i>	
Read/Write Lectures: Fostering Active Participation and Increasing Student Engagement in the Lecture Hall .....	503
<i>Kai Michael Höver and Michael Hartle</i>	
Re-engineering of Pedagogical Scenarios Using the Data Combination Language and Usage Tracking Language .....	506
<i>Diem Pham Thi Ngoc, Sébastien Iksal, and Christophe Choquet</i>	

Re-engineering of the Apprenticeship Electronic Booklet: Adaptation to New Users Requirements .....	511
<i>Lahcen Oubahssi, Pierre Laforcade, and Philippe Cottier</i>	
Relationships between E-Learning Systems and Learning Outcomes: A Path Analysis Model .....	516
<i>Sean Eom</i>	
Remote Permission Management in Third-Party Tools and e-Learning Systems .....	521
<i>Jorge Fontenla González, Manuel Caeiro Rodríguez, and Martín Llamas Nistal</i>	
Re-thinking the Forum .....	523
<i>Andrea Camusi and Carlo Giovannella</i>	
Retrieval Information Model for Moodle Data Visualization .....	526
<i>D.A. Gómez-Aguilar, M.Á. Conde-González, R. Therón, and F.J. García-Peñalvo</i>	
Reusing Adaptation Strategies in Adaptive Educational Hypermedia Systems .....	528
<i>Joshua Scotton and Alexandra I. Cristea</i>	
Scripted Collaborative Learning Based on Collaborative Learning Flow Patterns: A Case Study Using COLLAGE Editor .....	533
<i>Nikos P. Michailidis, Stavros N. Demetriadis, and Yannis A. Dimitriadis</i>	
SeGAE: A Serious Game Authoring Environment .....	538
<i>Amel Yessad, Jean-Marc Labat, and François Kermorvant</i>	
Self-Esteem Conditioning for Learning Conditioning .....	541
<i>Imène Jraidi, Maher Chaouachi, and Claude Frasson</i>	
Similarity Contents Selection Mechanism for Learner's Device Using Delivery Context Ontology and Rules .....	546
<i>Yoonsoo Lee, Hyunoh Doh, Haanwoong Choi, and Jaehyuk Cha</i>	
Simple Learning Design 2.0 .....	549
<i>Guillaume Durand, Luc Belliveau, and Benjamin Craig</i>	
Smart Timetable Plate for Classroom .....	552
<i>Yuan-Chih Yu, Shing-chern D. You, and Dwen-Ren Tsai</i>	
Spatializing Social Practices in Mobile Game-Based Learning .....	555
<i>Susan Gwee, Yam-San Chee, and Ek-Ming Tan</i>	
Students Attitude and Learning Effectiveness of Emotional Agents .....	558
<i>K. Chatzara, C. Karagiannidis, and D. Stamatis</i>	
Student-Produced Vodcasts as Active Metacognitive Learning .....	560
<i>Andrew Litchfield, Laurel Evelyn Dyson, Marijke Wright, Sojen Pradhan, and Barbara Courtille</i>	
Students' Perceptions of the Factors Leading to Unsuccessful Group Collaboration .....	565
<i>Shuangyan Liu, Mike Joy, and Nathan Griffiths</i>	
Students' Competitive Preferences on Multiuser Wireless Sensor Classroom Interactive Environment .....	570
<i>Ben Chang and Chien Wen Chen</i>	

Supporting Cognitive Competence Development in Virtual Classrooms - Personal Learning Management and Evaluation Using Pedagogical Agents .....	573
<i>Stefan Weinbrenner, H. Ulrich Hoppe, Linda Leal, Milcon Montenegro, William Vargas, and Luis Maldonado</i>	
Supporting Collaborative Learning Processes in CVEs by Augmenting Student Avatars, with Nonverbal Communication Features .....	578
<i>Thrasylvoulos Tsiatsos and Theodouli Terzidou</i>	
Supporting Exception Handling in Scripted Collaborative Courses .....	581
<i>Roberto Perez-Rodriguez, Manuel Caeiro-Rodriguez, and Luis Anido-Rifon</i>	
Supporting High-quality Early Childhood Education Services through ICTs .....	586
<i>Rubén Míguez, Juan M. Santos, and Luis Anido</i>	
Supporting Instructors in Designing Tablet PC-Based Courses .....	591
<i>José-Vicente Benlloch-Dualde, Félix Buendía, and Juan-Carlos Cano</i>	
Supporting Partially Distributed, Case-Based Learning in an Advanced Undergraduate Course in Usability Engineering .....	594
<i>Hao Jiang, John M. Carroll, Marcela Borge, and Craig Ganoe</i>	
Taking Advantage of Web 2.0 and Video Resources for Developing a Social Service: Babelium Project, the Web Community for Foreign Language Speaking Practice .....	597
<i>Silvia Sanz Santamaría, Juan Antonio Pereira Varela, and Julían Gutiérrez Serrano</i>	
Tangible Cubes Used as the User Interface in an Augmented Reality Game for Edutainment .....	599
<i>Carmen M. Juan, Giacomo Toffetti, Francisco Abad, and Juan Cano</i>	
The CAE-L Cultural Framework: Definition, Instances and Web Service .....	604
<i>Craig Stewart, Tim Brailsford, Krishna Chandramouli, and Alexandra I. Cristea</i>	
The Design and Application of an Automatic Course Generation System for Large-Scale Education .....	607
<i>Xiaohong Tan, Carsten Ullrich, Yan Wang, and Ruimin Shen</i>	
The Effects of Prior Computer Experience and Gender on High School Students' Learning of Computer Science Concepts from Instructional Simulations .....	610
<i>Ming-Puu Chen</i>	
The Emotional Machine: A Machine Learning Approach to Online Prediction of User's Emotion and Intensity .....	613
<i>Amine Trabelsi and Claude Frasson</i>	
The Integrated Lab: An Assessment to Combining Classroom Curriculum and Lab Experiments to Teach Information Systems Development Course .....	618
<i>Khalid A. Nafjan</i>	
The STELLAR Science 2.0 Mash-Up Infrastructure .....	621
<i>Fridolin Wild, Thomas Daniel Ullmann, and Peter Scott</i>	

T-learning in Telecommunication Engineering: The Value of Interactive Digital TV in the European Higher Education Area .....	624
<i>Martín López-Nores, Yolanda Blanco-Fernández, José J. Pazos-Arias, and Jorge García-Duque</i>	
Tool for Generation IMS-QTI v2.1 Files with Java Server Faces .....	627
<i>Antonio García, Roberto Barchino, Luis de Marcos, Eva García, José-Ramón Hilera, José-María Gutiérrez, Salvador Otón, José-Javier Martínez, and José-Antonio Gutiérrez</i>	
Towards a Competence Based System for Recommending Study Materials (CBSR) .....	629
<i>Athitaya Nitchot, Lester Gilbert, and Gary B. Wills</i>	
Towards a Distributed Architecture for Adaptive E-Learning System .....	632
<i>Sarab Al Muhaideb, Salah Hammami, and Hassan Mathkour</i>	
Towards an Enhanced Approach for Peer-Assessment Activities .....	637
<i>Mohammad AL-Smadi, Christian Gütl, and Frank Kappe</i>	
Towards Intelligent Collaborative Learning Simulations: Extending the IMS LD Standard by Web Semantic Based ITSs .....	642
<i>Maha Khemaja, Sameh Ghallabi, and Valérie Monfort</i>	
Towards the Generalization of Game-Based Learning: Integrating Educational Video Games in LAMS .....	644
<i>Ángel del Blanco, Javier Torrente, Pablo Moreno-Ger, and Baltasar Fernández-Manjón</i>	
Toys++ AR Embodied Agents as Tools to Learn by Building .....	649
<i>Luca Simeone and Salvatore Iaconesi</i>	
Transfer of Educational Methods through Open Sourcing of Learning Management Systems .....	651
<i>Imed Hammouda, Rami Laine, and Jari Peltonen</i>	
Using Feedback Tags and Sentiment Analysis to Generate Sharable Learning Resources Investigating Automated Sentiment Analysis of Feedback Tags in a Programming Course .....	653
<i>Stephen Cummins, Liz Burd, and Andrew Hatch</i>	
Using Interactive Videoconference to Promote Active Learning in a Blended Learning Environment .....	658
<i>Covadonga Rodrigo, José Luis Delgado, and Jorge Vega</i>	
Using SaaS and Cloud Computing for “On Demand” E Learning Services Application to Navigation and Fishing Simulator .....	663
<i>Valérie Monfort, Maha Khemaja, Nouha Ammari, and Fayssal Fehli</i>	
Using Semantic Documents and Social Networking in Authoring of Course Material: An Empirical Study .....	666
<i>Saša Nešić, Mehdi Jazayeri, Monica Landoni, and Dragan Gašević</i>	
Using Tangible Learning Companions in English Education .....	671
<i>Yi Hsuan Wang, Shelley S.C. Young, and Jyh-Shing Roger Jang</i>	

Web-Based Intelligent Tutoring Systems Using the SCORM 2004 Specification - A Conceptual Framework for Implementing SCORM Compliant Intelligent Web-Based Learning Environments .....	676
<i>Gustavo Santos and Álvaro Figueira</i>	
Web Tests in LMS Using Fingerprint Identification .....	679
<i>Charo Gil, Manuel Castro, Mudasser F. Wyne, and Russ Meier</i>	
What You Check is What You Get: Authoring with jEditOQMath .....	682
<i>Paul Libbrecht</i>	
Winkball for Schools: An Advanced Video Modelling Technology for Learning Visual and Oral Communication Skills .....	687
<i>James Ohene-Djan</i>	
WOntoVLab: A Virtual Laboratory Authorship Process Based on Workflow and Ontologies .....	690
<i>Daniel C. Cugler, Cristiane A. Yaguinuma, and Marilde T.P. Santos</i>	
<b>Doctoral Consortium</b>	
Appropriating Technology-rich Learning Spaces .....	695
<i>Nadia Pantidi</i>	
Change Management and Social Networks: The Enabling Role of e-Learning .....	697
<i>Sara Sterlocchi and Aurelio Ravarini</i>	
Developing Adaptive and Personalized Distributed Learning Systems with Semantic Web Supported Multi Agent Technology .....	699
<i>Birol Ciloglugil and Mustafa Murat Inceoglu</i>	
Model-Driven Development in the Production of Customizable Learning Objects .....	701
<i>Maria de Fátima C. de Souza, José A. de Castro Filho, and Rossana M.C. Andrade</i>	
Offline Mobile Learning: Open Platforms for ICT4D .....	703
<i>Sujan Shrestha, John P.T. Moore, and Jose Abdelnour-Nocera</i>	
Self-and Co-Regulation in a Computer Supported Collaborative Learning Environment among Key Stage Three Students .....	705
<i>Eunice Eytayo Olakanmi</i>	
<b>Advanced Learning Technologies for Disabled and Non-Disabled People (WALTD)</b>	
An Approach for Designing and Implementing a Computerized Adaptive Testing Tool for Applicants with Disabilities .....	708
<i>Monjia Balloumi, Mohsen Laâbidi, and Mohamed Jemni</i>	
How to Support Disabled and Non-disabled Learners with the ACCLIP Information Model .....	710
<i>Kalthoum Rezgui</i>	
Personalizing Accessibility to E-Learning Environments .....	712
<i>Mohsen Laabidi and Mohamed Jemni</i>	

Representing Contextual Features of Subtitles in an Educational Context .....	714
<i>Marion Hersh and James Ohene-Djan</i>	
Synote: Designed for all Advanced Learning Technology for Disabled and Non-Disabled People .....	716
<i>Mike Wald</i>	
Technology-enhanced Training for All: Evaluation Results from the Use of the e-Access2Learn Framework .....	718
<i>Demetrios G. Sampson and Panagiotis Zervas</i>	
User Centered Model to Provide Accessible e-Learning Systems .....	720
<i>Halima Hebiri, Mohsen Laabidi, and Mohamed Jemni</i>	
<b>Design Centered and Personalized Learning in Liquid and Ubiquitous Learning Places (DULP) Future Visions and Practical Implementations</b>	
An Innovative Approach to Improve the Performances of the Research Community .....	722
<i>Claudia Grieco, Giuseppina Rita Mangione, Francesco Orciuoli, and Anna Pierri</i>	
An Ontology Based Approach for Selection of Appropriate E-learning Personalization Strategy .....	724
<i>Fathi Essalmi, Leila Jemni Ben Ayed, and Mohamed Jemni</i>	
A Collaborative Ubiquitous Learning Approach for Conducting Personal Computer-Assembling Activities .....	726
<i>Judy C.R. Tseng, Chih-Hsiang Wu, and Gwo-Jen Hwang</i>	
DULP Perspectives in a Learning Management System .....	728
<i>Francesco Di Cerbo, Gabriella Doderò, and Paola Forcheri</i>	
Expanding the Learning Environment: Combining Physicality and Virtuality - The Internet of Things for eLearning .....	730
<i>Muriel Garreta Domingo and Juan Antonio Mangas Forner</i>	
From Learning Styles to Experience Styles .....	732
<i>Carlo Giovannella, Andrea Camusi, and Chiara Spadavecchia</i>	
Implementation of Affective States and Learning Styles Tactics in Web-Based Learning Management Systems .....	734
<i>Farman Ali Khan, Sabine Graf, Edgar R. Weippl, and A Min Tjoa</i>	
Instructional Design with PoEML in a E-learning-as-a-Service Model. Mixing Web and IPTV Learning Experiences .....	736
<i>Manuel Caeiro-Rodríguez, Jorge Fontenla-González, Roberto Pérez-Rodríguez, and Luis Anido-Rifón</i>	
Mobile Learning & Commuting: Contextual Inquiry and Design of Mobile Scenarios .....	738
<i>Eva Patricia Gil-Rodríguez and Pablo Rebaque-Rivas</i>	
Prete-a-apprendre+: Towards Ubiquitous Wearable Learning .....	740
<i>Imran A. Zualkernan, Nihal Al-Khunaizi, Sara Najar, and Nour Nour</i>	

Towards a More Fluid Learning Environment Based on Virtual Communities .....742  
*Luigi Colazzo, Andrea Molinari, and Nicola Villa*

**The Trend and Development of Game and Toy Enhanced Learning**

An Analysis of Students’ Intention to Use Ubiquitous Video Game-Based  
Learning System .....744  
*Chun-Yi Shen, Han-Bin Chang, Wen-Chih Chang, and Te-Hua Wang*

Game-play as Knowledge Transformation Process for Learning .....746  
*Ming-Puu Chen and Chun-Yi Shen*

Pilot Study of Past Decade Game-Based Learning Journal Papers Survey  
from the Technology Perspective .....748  
*Ben Chang*

Using Game Quests to Incorporate Learning Tasks within a Virtual World .....750  
*Zhi-Hong Chen and Tak-Wai Chan*

**Tutorial**

Learning Math and Statistics on the Cloud, Towards an EC2-Based Google  
Docs-like Portal for Teaching / Learning Collaboratively with R and Scilab .....752  
*Karim Chine*

**Author Index** .....754



## Tool for generation IMS-QTI v2.1 files with JavaServer Faces

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**Abstract**—This paper presents a web tool that uses JavaServer Faces to design questions graphically, to test the outcome in a learning environment and to export them using the QTI v2.1 specification in order to ensure interoperability between different learning systems.

**Keywords**—IMS-QTI, test, evaluation, assessment, standard

### I. INTRODUCTION

IMS Question & Test Interoperability v2.1 specification (QTI v2.1.) [1] defines a standard format for the representation of queries and results of evaluations made in an e-learning framework. With this standard, it is possible to get interoperability between different learning systems that currently exist. In order to achieve this interoperability, we have built a tool that complies with IMS Content Packaging v1.1.4 and that generates content packages which are transportable between e-learning platforms. Moreover, the tool has been designed as a web platform that can be accessed via Internet. JavaServer Faces framework has been used to build it [2].

### II. QTI v2.1.

QTI v2.1. specification defines a form to represent elements of evaluation: simple choice, multiple choice, matching (figure 1), association, ordering, etc.

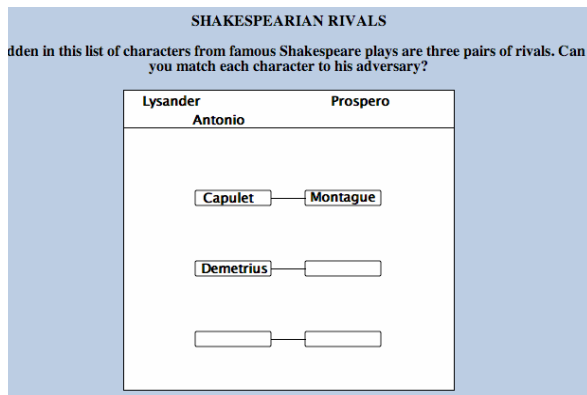


Figure 1. Example of matching question

A QTI file is a XML file that has a defined structure. An example of simple assessment is shown in figure 2.

```
<?xml version="1.0" encoding="UTF-8" ?>
<assessmentItem xmlns="http://www.imsglobal.org/xsd/imsqti_v2p1"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.imsglobal.org/xsd/imsqti_v2p1
  imsqti_v2p1.xsd" identifier="choice" title="España" adaptive="false"
  timeDependent="false">
  <responseDeclaration identifier="RESPONSE" cardinality="single"
    baseType="identifier">
    <correctResponse>
      <value>ChoiceA</value>
    </correctResponse>
  </responseDeclaration>
  <outcomeDeclaration identifier="SCORE" cardinality="single"
    baseType="integer">
    <defaultValue>
      <value>0</value>
    </defaultValue>
  </outcomeDeclaration>
  <itemBody>
    <p>Año de aprobación de la Constitución Española</p>
    <p></p>
    <choiceInteraction responseIdentifier="RESPONSE" shuffle="false"
      maxChoices="1">
      <prompt>En el año...?</prompt>
      <simpleChoice identifier="ChoiceA">1978</simpleChoice>
      <simpleChoice identifier="ChoiceB">1905</simpleChoice>
      <simpleChoice identifier="ChoiceC">1987</simpleChoice>
    </choiceInteraction>
  </itemBody>
  <responseProcessing
    template="http://www.imsglobal.org/question/qti_v2p0/rptemplates
    /match_correct" />
</assessmentItem>
```

Figure 2. QTI XML example

Our tool permits to configure all these XML elements so that different kinds of evaluation elements can be designed.

### III. TOOL

JavaServer Faces framework has been used to build this tool.

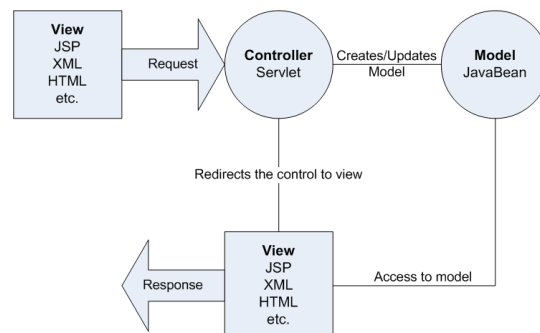


Figure 3. Model-View-Controller

This framework uses Model-View-Controller (MVC) (figure 3) to structure the application [3], so it is possible to establish a clear difference between different application components.

Once logged in, the tool has different options to manage the evaluation elements such as Category and Items Manager, Import Categories and Export Categories (figure 4).



Figure 4. Main Screen

It is possible to group different questions into categories from the Category and Items Manager option (figure 5). In this option the tool permits to add and remove categories.

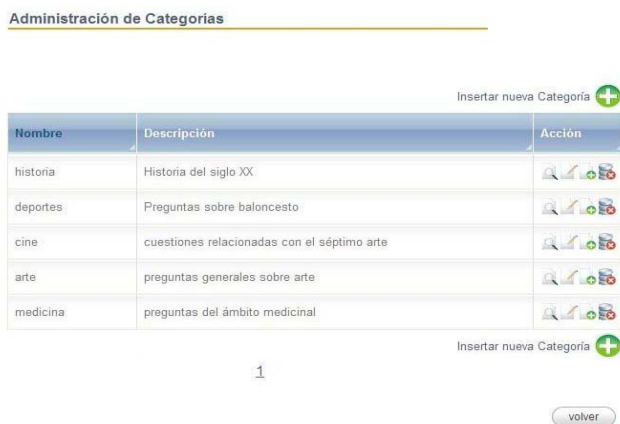


Figure 5. Category and Items Manager

When a category is selected, it is possible to create new different questions using an easy-to-use editor (figure 6). This editor gives the opportunity to select the question type (simple answer, multiple choice, etc.) and to write the question title. Moreover, with the editor is possible to attach images, to establish links, to format, etc. questions in order to better illustrate them.

The tool also permits to import the questions from a QTI v2.1. file and then to edit them. This assures the interoperability between different systems that use this standard.



Figure 6. Creation Question

Finally the tool also has an export option to generate QTI v2.1. files. That ensures interoperability too, because these files may later be loaded into compliant systems (figure 7).

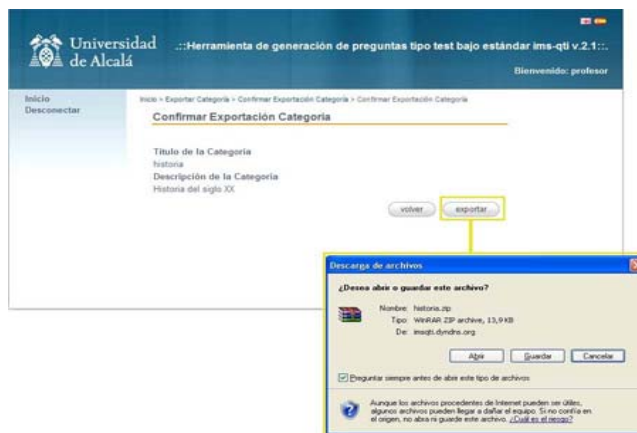


Figure 7. Exporting Questions

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- [1] QTI specification <http://www.imsglobal.org/question/>
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