The International Conference on Advanced Learning Technologies (ICALT 2001) brings together researchers, academics, and industry practitioners who are involved or interested in the design and development of advanced and emerging learning technologies. Understanding the challenges faced in providing technology tools to support the learning process and ease the creation of instructional material will help build a valuable direction for further research and implementation.

The rapidly increasing interest in advanced learning technologies provides many challenges to those engaged in such research and development enterprises. On the one hand, the capabilities of digital technologies in providing and contributing to learning environments are opening up new approaches that utilise, for example, multimedia, virtuality, and collaborative methods of knowledge management. On the other hand, the changing and increasing demands of education in this technological age require practical techniques and applications that benefit a wider range of abilities, learning styles, and organisations.

Interesting and important issues being addressed by the Conference include:

Where should the computer be placed in these developments and what roles should it undertake in learning environments?

What theories and representations should underpin research and what are the fruitful directions to follow and exploit?

How should the adaptive intelligences of computing systems and teachers/students interact and collaborate?

What pedagogies are appropriate and useful to guide applications, and what tools and media are required for developers, teachers, and students?

Evaluation is an important but often neglected issue; what methods are appropriate to provide guidance and empowerment to these advances in learning technologies and their implementations?

Under these themes, several papers focus on the architectures of systems that link pedagogic approaches to digital technologies in order to provide a variety of learning environments that may be virtual, large scale, adaptive, and able to support collaborative interactions. Issues of standards and the re-usability of software and materials are also discussed.

The learning theories and formalisms underpinning instructional designs within these environments include affective and attitudinal factors, and link to a variety of teaching/learning strategies dealing with constructivism and scaffolding, activity and problem based methods, and learning management. Specific issues address structuring, hypermedia, and concept mapping, interactivity and engagement, collaborative techniques, and case-based training. These applications are set in contexts that span CAD, Computer Programming, Business Studies, Language Learning, Computer Based Assessment, and Student Counselling.
The papers focusing on Authoring and System Development are largely Web oriented but feature techniques of reverse-and re-engineering of materials, and systems that provide management structures as well as adaptive interactions. These relate to Tools and Systems to support knowledge management and collaborative working, and techniques of concept mapping, audio-graphics devices and the use of WebCT. Applications using Virtual Learning Environments and Intelligent Tutoring Systems are also well represented, tackling issues such as the role of the human teacher in relation to ITSs, multi-modalities as cognitive tools, the application of hybrid expert systems, and Text to Speech Agent techniques.

Within interactive and cooperative learning, systems support for asynchronous and synchronous collaborative discourse is becoming increasingly important. Several papers consider the analysis of discourse, the roles of tutors in facilitating and managing computer based discourse, the development of argumentation skills, the social networks that can be established, and the fostering of collaborative writing.

Evaluation has not been neglected within the Conference agenda. Studies that are being reported have examined projects that use advanced learning technologies and intelligent tutoring systems, learner centred scaffolding, student modelling and learning practices, and Web based environments. The papers also comment on techniques of determining pre-requisites, mapping student information needs, and monitoring.

Finally, on a larger scale, some papers discuss the establishment and management of learning networks, and the interlinking of resources within and between institutions that feature Distance Learning, and have a concern for widening access within a concept of Lifelong Learning.

There is no doubt that, in the future, e-learning, in response to the requirements of society will transform education and training in comprehensive ways. From an institutional and administrative standpoint, e-Universities and Colleges will expand their businesses via distance learning; the production of material will essentially involve companies that utilise the instructional intelligence and capital of teachers who are effective communicators in the new media. The future is hard to read, with its increasing diversity and volatility, and with an increasing emphasis on marketability and cost-effectiveness set against political and social pressures for widening access under a lifelong learning concept. Most predictions prove wrong, but the success of e-learning depends critically on developing pedagogies and teaching/learning methods that are able to adapt to changing circumstances. For this to be manageable and affordable, research needs to provide a framework to guide the pragmatics of progress. Hopefully ICALT2001, launched by Professor O’Shea’s keynote address can make its distinctive contribution to this objective. The Conference presents a rich variety of theories, applications and expertise relating to Advanced Learning Technologies which should stimulate an active and positive response from Conference participants.

We are delighted to report that IEEE-ICALT2001 attracted almost 200 submissions, from 34 countries. All submissions were reviewed by an international panel of expert referees, resulting in about 30% acceptance rate in the form of full papers. Some other high standard submissions were selected for presentation and publication as short papers and as posters. We regard all of them as having the higher academic value, and expect all authors will contribute much to improvement of education in each country as well as international fields. Finally, we are pleased to acknowledge the invaluable assistance of the international referees, who are named separately in this proceedings.

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Editors