

- IFIP WG 3.1: Informatics and ICT in Secondary Education
IFIP WG 3.3: Research on Educational Applications of Information Technologies
IFIP WG 3.5: Informatics & Elementary Education
IFIP WG 3.8: Lifelong Learning
IFIP WG 3.9: Special Interest Group on Digital Literacy

IFIP Working Conference: New Developments in ICT and Education

Book of Abstracts

Editors

David Benzie

Kwok-Wing Lai

Christophe Reffay

UMR Sciences Techniques
Éducation Formation,
ENS Cachan & INRP

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New Developments in ICT and Education
Book of Abstracts
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Editors

David Benzie
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Conference organisers

The conference has been organised by the International Federation of Information Processing (IFIP) Working Groups (WGs) 3.1, 3.3, 3.5, 3.8 & 3.9.

IFIP Working Groups provide researchers and educationalists with an international forum where ideas, practical educational experiences, research and policy can be presented and discussed. Through this, educationalists can develop appropriate pedagogy, effective learning environments and teacher education programmes.

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Preparing for lifelong e-learning

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Abstract

In this paper, the author examines digital inclusion. The use of interactive tools to locate, make meaning of, and produce digital content in workplace contexts and broader social contexts are analysed based on a definition of inclusion related to social practices. The general scope of the paper is lifelong learning. Since information and communication technologies offer new opportunities to adult learners, digital inclusion is considered an important prerequisite for lifelong learning. In the paper, the author presents one strategy for removing barriers to lifelong learning caused by lack of awareness, confidence, and skills relating to digital technologies.

The design and implementation of the strategy was initiated by the Danish Ministry of Education. The author of this paper designed the learning content for adults with little previous experience and working knowledge about interactive tools and the Internet. The author also designed the learning objectives.

Danish adults were then supported nationwide achieving these objectives. By examining the outcome of these learning efforts, the research provides knowledge about what works in digital inclusion. The results of the research indicate that a self-motivated learning strategy foster personal development, social inclusion, and employability. One spinoff is an increased desire to learn more about the use of digital technologies. Another is an increased desire to learn in general. This approach to digital literacy for adults thus stimulates to and prepares for lifelong learning.

Keywords

Pedagogy for digital literacy, digital inclusion, digital literacy, adult learners, motivation, interactive tools, connected lives, networked society

Biography



Bent B. Andresen (PhD) is an associate professor at the Danish School of Education at Aarhus University and a member of the IFIP working group on lifelong learning. Research interests include teaching and learning throughout life, pedagogical choices, digital technologies in education, and methods of research and assessment. He has written several books and contributed to others. See www.dpu.dk/om/bba for further details

e-Safety: what are the issues for teacher education?

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Abstract

e-Safety is a issue that has come to prominence in a relatively short period of time. In the UK the “UK Children Go Online” report (Livingston & Bober, 2005) played a significant role in raising the profile of issues associated with the safety of children and young people when using the Internet. Shortly after their report was published the UK Government set up the “Child Exploitation and Online Protection Centre” (CEOP, 2005) with a remit to

“offer advice and information to parents and potential victims of abuse 24 hours a day. [...] it will also carry out proactive investigations and work with police forces around the world to protect children” (CEOP, 2005)

This initial focus on “child as victim” is echoed in the early videos that were used to raise awareness amongst parents. The “Where’s Klaus?” (CEOP, 2008) video is a good example – Klaus, the innocent child, is assailed in his bedroom by several groups of “undesirables” all made possible by his mother’s naivety.

The UK Government commissioned the Byron Review in 2007 and this was published in 2008 under the title “Safer children in a digital world” (Byron, 2008). One of the consequences of this document, and of the report “EU Kids online” (Livingstone & Haddon, 2009), was to move the debate on by recognising the agency of the child. One of Byron’s key messages is that children must be empowered to keep themselves safe – it is simply not possible to surround them with an impregnable defensive wall that will keep undesirable contact and content at bay. Livingstone & Haddon (2009:2) argue that “policy must move beyond the division between child victims and adult perpetrators” and go on to highlight the active role that children and young people can, and do, play in making the Internet a place of both opportunity and risk.

The growing recognition of the need to account for the agency of children and young people has been labelled as “Online safety 3.0”. Magid & Collier (ConnectSafely, 2009) argue that young people need to be seen as “participants, stakeholders and leaders” in a participatory culture. This perspective creates a focus on values – how are you going to participate and in what direction will the leadership that you exercise take those who follow?

This conference session will focus on the challenges that the e-Safety debate has created, and is creating for those who are involved in teacher education.

Keywords

e-Safety, pupils, teacher education

Biography



David Benzie is Head of e-Learning at University College Plymouth St Mark & St John. In addition to institutional responsibility for the development of e-Learning he teaches on pre-service and in-service courses for teachers. His main research interest is in socio-cultural theories of learning applied to educational settings.

Teaching didactics of informatics to secondary school informatics student teachers

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Abstract

In this paper, the authors introduce an innovative conception for a lecture course "Didactics of Informatics I", in which Informatics student teachers learn teaching technical Informatics concepts to students of different secondary school types. The organization of the German school and teacher education system is outlined in the paper. Following on, the main requirements for the course are described and are linked to the organizational setting. The details of the course are described as are the first experiences with its implementation. Finally, the authors discuss the potential of the approach for web-based training courses for teachers of Informatics, for which there is a great need in many federal states.

Keywords

Informatics teacher education, didactics of informatics, active learning, secondary education, blended learning, e-learning, notebook university

Biographies



Torsten Brinda studied Informatics at the University of Dortmund (Germany) until 1998 before joining the "Didactics of Informatics" groups at the Universities of Dortmund (until 2002) and Siegen (2002 to 2005). In 2005 he became an associate professor for "Didactics of Informatics" at the University of Erlangen-Nuremberg. In 2008 he became vice chairman of the Centre of Teacher Education at the University of Erlangen-Nuremberg



Peter Hubwieser is an associate professor at the Technical University of Munich. He initiated and designed the new mandatory subject of Informatics at Bavarian Gymnasiums from 1994 to 2007. In 2008 he was asked to design a core curriculum for teacher education in Informatics by the "Deutsche Fakultätentag" (the Union of all faculties in Germany). In 2009 he became a member of the innovative School of Education at the Technical University of Munich

Information, cooperation and knowledge sharing: building an internet platform to support students and teachers learning foreign languages

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Abstract

Within a few years all pupils from primary schools in Switzerland will start to learn a foreign language in third grade. Therefore most teachers will have to improve their language skills. It is evident that the Internet has the potential to be a big help in this situation.

The goal is to build an Internet platform, www.passepartout-bl.ch, which will link all relevant information, teaching materials, self-teaching resources and opportunities for cooperation that teachers need to organise the implementation of a new language in the curriculum.

The concept of the platform is based on the works of the Munich knowledge management model of G. Reinmann and H. Mandl, which concentrates on psychological factors and its processes and on the knowledge building-blocks of Probst et al., which help to order knowledge and its management systematically.

Future stakeholders have been questioned and their comments have been taken into account during the development of the concept of the platform. Letting people take an active part in the development encourages knowledge sharing and use of the resources that are provided via the platform.

Knowledge sharing and cooperation imply a change in the working style of teachers. Therefore it is important to consider the change stages as described by J.P. Kotter to encourage the willingness of teachers for change.

Keywords

Knowledge sharing, cooperation, bundling knowledge, change, foreign language, Internet platform

Biography



Yvonne Buettner-Ringier is responsible for the ICT in-service teacher education at the department of education in the canton of Basel-Landschaft, Switzerland. She specialises in e-learning and knowledge management

Connected & caring: developing K-6 teachers who integrate ICT to support children's learning

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Abstract

A new approach to teacher education has been implemented at the University of Melbourne, Australia, with the Master of Teaching (Primary) course that commenced in 2008. This paper will first describe this two-year graduate teacher education course where teacher candidates are in schools two days each week, and then describe the subject *ICT in Primary Education* and its design. This subject has been designed and implemented so that the focus of the subject is on integrating Information & Communication Technologies (ICT) in teaching and learning to support children's learning, rather than on ICT skills, although many ICT skills are developed through the subject.

The course and subject support teacher candidates as they start their journey as members of the teaching profession and community, so that they will become teachers who are connected to and supportive of other teachers and who see supporting children's learning as their goal. Teacher candidates see the relevance and applicability of their learning in the subject described because learning is achieved by applying and refining knowledge of using ICT to support children's learning in authentic contexts. This combination of developing a strong learning community through the design of the Master of Teaching (Primary) course and in developing a beginning sense of being a teacher and making decisions about technology use to support children's learning in the subject *ICT in Primary Education* is a powerful one that is yielding very positive outcomes.

Keywords

Teacher education, ICT, graduate education, ICT integration

Biography



Dianne Chambers is a Senior Lecturer and Assistant Dean (Learning Technologies) with the Melbourne Graduate School of Education at the University of Melbourne, Australia. Dianne teaches in the areas of ICT in education and Education for Sustainability. Dianne's research areas include the uses of ICT, problem based learning, and Education for Sustainability in teacher education.

Introducing informatics concepts through a contest

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Abstract

Concepts of informatics play a central role in all curricula and standards for informatics education at secondary schools. In practice at schools however very often the training of skills in application software is given much more room than the understanding of fundamental concepts of informatics. The reasons for that may be manifold: lack of time, missing teacher education, missing materials, pressure from industry, etc. In this paper, we are going to show how informatics concepts may be introduced to schools in a student-motivated and playful way. By the example of an international informatics contest we present how a contest may introduce a variety of even advanced concepts in a very short time. And about that the students need no specific pre-knowledge and learn in an explorative way to solve the given contest problems. A main focus while preparing a contest should be given to the development of good tasks that also can be used by the students and teachers in their further learning and teaching activities.

Keywords

Concepts of informatics, informatics contest, explorative learning, learning by competition

Biographies



Valentina Dagiene is the head of the Informatics Methodology Department at the Institute of Mathematics and Informatics and a professor at Vilnius University. She has authored more than 150 papers and 60 textbooks. Her main research focus is informatics didactics, e-learning, implementation of ICT in education, as well as localization of software. She works at various expert groups under the Ministry of Education and Science in Lithuania and abroad.



Gerald Futschek is member of the Institute of Software Technology and Interactive Systems at Vienna University of Technology. In the Austrian Computer Society he has the position of the president. His main research focus is software engineering and informatics didactics. He is highly involved in teacher education. In the Austrian Computer Society he is responsible for skills certification and IT competitions

How our countries are doing: an overview based on national reports

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Abstract

The IFIP has been working for many years to disseminate the information, methods and ideas about the meaningful use of information and communication technologies in education. There have always been discussions about what might be the best way to do this. Collecting country reports containing an analysis of the situation in the respective country has been theoretically a good solution but it is not an ideal one because not all the countries send their reports and analysis. Still many countries are sending the documents. One way to improve the usability of the country reports is to make a summary of the contents of the reports. The following is one attempt to make a holistic picture of the achievements in the area. The authors of this summary will be happy if this summary in any way can help the reader in finding information in the country reports or finding some other sources of information and connecting people and institutions to work more efficiently.

Keywords

ICT, education, school, teacher, student, curriculum, computer, university

Biographies



Valentina Dagiene is the head of the Informatics Methodology Department at the Institute of Mathematics and Informatics and a professor at Vilnius University. She has authored more than 150 papers and 60 textbooks. Her main research focus is informatics didactics, e-learning, implementation of ICT in education, as well as localization of software. She works at various expert groups under the Ministry of Education and Science in Lithuania and abroad.



Jari Koivisto is a Counsellor of Education at the Finnish National Board of Education responsible for the national curriculum in physics in general education. He is Finnish coordinator in the OECD/CERI innovation programme as well as organiser of the Finnish National Computer Olympiad together with the team. Also he is a Finnish representative in the TC3.

Sharing and pooling professional resources: what uses for secondary school teachers?

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Abstract

Online communities feature in most branches of learning in the French educational system. These spaces have two principal forms: newsgroups and spaces of sharing and pooling professional resources. Some of them have been created by hierarchical authorities, voluntary teachers built up others outside their institution. These communities meet a great success and thus teachers seem to be able to satisfy some of their professional expectations. Newsgroups in the educational context were the subject of many researches in the French-speaking world. These works highlighted few stabled phenomena among teachers' uses. In this article, we will try to show that the observed uses in the newsgroups are also found in a sharing and pooling community for economics and law teaching.

Keywords

Secondary school teachers, online communities, pedagogical resources, distribution disparities.

Biographies



Hadhemi Drissi Louiz is currently assistant professor of economics and management at the Higher Institute of Technological Studies (Tunis, TUNISIA). She has experience of using ICT in higher education and she teaches about the use of ICT in higher education at the Francophone University Agency. She is currently studying a Doctorate curriculum at ENS Cachan (France).



Isabelle Quentin is *professeure agrégée* (4 year diploma degree) in management. Between 2005 to 2009, she was in charge of training new teachers (IUFM : university institute for the training of teachers). She now works for the board of education in Lyon where she helps high school teachers who are experimenting with new learning techniques. She is also working on her PHD and is being supervised by Eric Bruillard.

New ways of organising education

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Abstract

The traditional class room usually consists of 25-30 students with the teacher in front of the class. The students are listening, writing, making exercises, individually or in pairs. The teacher gives instruction, explains, tells stories, helps the students with their assignments by walking around. There are five major problems in this traditional organisational model.

1. In moments of frontal interaction the teaching activity is high, the learning activity is often quite low.
2. The direct interaction between the learner and the teacher is limited because of the number of students asking for personal attention.
3. By this the learning outcome is not very high. The teaching is aimed at an average level of understanding in the class.
4. Through the eyes of many students school is seen as a necessary evil, not as a place to become stimulated and encouraged.
5. There is a lack of capable teachers in a lot of countries.

At Helen Parkhurst, secondary Dalton school in Almere, the Netherlands, we are exploring new organisational models (Hogenbirk en Braak, 2008 and 2009).

In these models the students learning is the central starting point. Firstly that highly determines the nature and order of the content. Daily life problems and content in recognizable contexts are characterizing the lessons. There is much room given to the students to make their own choices with respect to learning activity, order and pace.

Secondly the teacher is most of the time teaching by walking around, assisting, coaching and explaining. S/he pays attention to the individual and to collaborative groups of 3 or 4 students.

Thirdly we have appointed assistant teachers and student teachers to bring in more "helping hands" into the group. An example of an organisational model is that two classes are being taught by one teacher and two assistant teachers. This is almost cost-effective.

Finally we use ICT. We started in some classes with a one laptop per child program. In other classes we have a ratio of about 1:3.5 computers per child. The digital content of the learning materials is arranged by the teacher and s/he also develops or collects the digital assignments for the students.

I propose a creative workshop, brainstorming on possibilities for new organisational concepts and models, based on the above described four principles. In this workshop the following questions will be addressed:

1. How to establish a sound balance between formal learning content and informal day-to-day contexts and problems?
2. How to teach and motivate teachers to obtain the necessary coaching competences?

3. What organisational models with what restrictions can be used when applying assistant teachers? What are their tasks and competencies?
4. How can we get teachers trained and willing to compose, arrange and develop ICT-rich learning environments?

Keywords

Secondary education, teachers, (in)formal learning, learning environment, organisation

Biography



Pieter Hogenbirk became rector of Helen Parkhurst Dalton School in January 2008. Between 2000 and 2008 he was an education inspector with special duties in the field of ICT in education. He is chair of the IFIP-Working Group 3.1 and has been involved in a number of Dutch, European (eTwinning) and Unesco projects. Since 1988 he has managed over 100 projects relating to ICT in education.

Analysing online interaction within the AskNRICHers' virtual world

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Abstract

My recent research has centred around AskNRICH, the web board conference section of the NRICH mathematics website (www.nrich.maths.org.uk) and the interactions between young people as they pursue serious mathematical study away from the classroom. There have been many studies that have analysed contributions to Computer Mediated Communication forum discussions, particularly in higher education, and various approaches and frameworks for analysis have been developed. However owing to the nature of participation in this AskNRICH forum I identified the need for a new analytical approach. The AskNRICH participants (the AskNRICHers), as well as many being of (secondary) school age, are very different to participants in previous studies because:

- participants belong voluntarily
- the conference board is primarily used only at home for 'pleasure' and is thus not part of any set course
- topics are only raised because they are important to the individual making the initial post
- there is no teacher/lecturer led element

This paper reports on the way of working I undertook for analysing the messages as I searched out the daily 'goings-on' of these young people who, working on their own, at home and alone, meet like-minded peers only in a virtual space. Working with upwards of four thousand messages, I formed an interpretive analysis of the accompanying text and developed an analytical approach that could impose order on, and make sense of, the complexities of the vast data source available within AskNRICH.

Keywords

virtual worlds, CMC, peer teaching and learning, mathematics

Biography



Libby Jared is a lecturer in mathematics education at the Faculty of Education, Cambridge University. As one of the co-founders of the NRICH mathematics project, my main research interests focus on the potential educational changes, within the teaching and learning of mathematics, that can result from the current modern technologies

One to one laptop projects in French schools: reflections on a first round of experience

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Abstract

In the past 10 years, the availability of technology (and particularly mobile technology) in secondary education has soared. Now, at least in western countries, high schools are equipped not only with ordinary PCs, but with interactive whiteboards, laptop computers, tablet PCs and so on. Various projects aiming to equip students and teachers with mobile ICT devices have been launched (Cavallo, Papert, & Stager, 2004; Khaneboubi, 2009; Rinaudo, Turban, Delalande, & Ohana, 2008; Warschauer, Grimes, Rousseau, Suhr, & Nyberg, 2005).

These technological devices come with a huge variety of resources and content available on line. In particular, many initiatives from free and open sources software communities allow educators to distribute to their students software used at school and even to shape technologies to their needs, free of charge. The development of such resources brings new opportunities (OECD, 2007).

Therefore, educators working in schools that participate in one-to-one programmes are not restrained by a lack of hardware or software: Wikis, learning platforms, blogging platforms, instant messenger, chat rooms or even email are convenient instruments for implementing constructivist teaching and learning environments. But to what extent are the approaches proposed by thinkers like Dewey or Freinet really used?

We have studied several important one-to-one French ICT programs in order to analyze how ICT allows educators to revisit this pedagogical legacy. Recently, a series of interviews and questionnaires with French teachers of lower secondary school have been performed in a rural area participating to a one-to-one project. The analysis of what teachers say about their activities shows that the use of ICT in a constructivist perspective is the appendage of subject matter that is not conducive for student global success. But things are evolving with the growing intervention of local authorities. These authorities officially have no responsibilities toward pedagogy, which remains a prerogative of the national government, but their action tends to impact this domain.

Keywords

French schools, mobile ICT devices, open source software, pedagogy, local authority intervention

Biographies



Mehdi Khaneboubi gained a PhD in Educational Studies with anthropology in 2007. His thesis focused on the use of laptop computers by middle schools teachers in a French rural area where each student had received a laptop. Since 2008 he has worked as a research assistant at the EDA (Education et Apprentissages) lab and as an instructor in Educational Technology at the Faculté des Sciences Humaines et Sociales - Sorbonne (University Paris Descartes).



Georges-Louis Baron is professor of education at Université Paris 5- René Descartes and head of the EDA (Education et Apprentissages) research lab. His main research interests are linked with the study of how ICT innovations in educational settings eventually transform themselves in everyday realities. He is working on research themes linked with students' representations and knowledge of ICT, the mutation of resources for learning and teacher education.

Lifelong learning in New Zealand schools

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Abstract

This paper discusses the complexity of the concept of lifelong learning and provides some preliminary findings of a recent study investigating the extent New Zealand teachers understand this concept and enact it in their practice.

Keywords

Lifelong learning, informal learning, roles of the teacher, information and communication technologies

Biography



Kwok-Wing Lai is professor of education and the Director of the Centre for Distance Education and Learning Technologies at the University of Otago College of Education, New Zealand. Wing's recent research is focused on online knowledge construction in higher education.

Personalisation and ICT: implications for teachers and staff development

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Abstract

Personalisation of learning has become prominent within many European educational policies (OECD, 2006) with potential impacts such as increasing student engagement and maximising opportunities for learning (Jarvela, 2006). ICT can enable teachers to facilitate personalisation of learning and students to have greater choices and flexibility (Underwood et al, 2007; Robinson et al, 2008). This exploratory case study focuses on radical curriculum changes introduced for a cohort of 11-12 year olds in a UK secondary school. The intention is to provide students with personalised learning enhanced through the development of self-management skills, within a technology-rich environment. The cohort were based in a large open plan space with 5 break-out rooms, designed to hold no more than 15 students to entail a seminar/small group approach. All students had a school-owned laptop which enabled an ICT-led presentation of the curriculum to be followed. The students needed to meet the weekly time requirements for each subject (for example, 3 hours for mathematics) and plan their 'learning journey' accordingly. The aims of this research were to: illustrate the achievements of the project; identify the processes which brought about success; and identify issues for the future. Data on the development of the project were collected from September 2008 to July 2009, and included interviews with teaching staff and school managers, online surveys of staff and students, focus groups with students, and observation. The findings are informed by activity theory, highlighting the extent to which traditional definitions of rules, community and divisions of labour in a classroom setting have been disrupted and transformed. The processes adopted to achieve included adapting staffing structures, the integration of ICT, the development of new assessment practices, and pedagogical shifts. The achievements include greater flexibility in terms of staffing, students developing self-management skills, enhancing personalisation through choice and flexibility (what, when and where), and a perceived impact on attainment. The paper concludes with a discussion of the changing role of the teacher in this context and the implications for staff development.

Keywords

Personalisation, ICT, pedagogy, CPD

Biography



Cathy Lewin is a Senior Research Fellow and Deputy Director of the CREATE research group. Her research interests concern young people and ICT, in relation to both formal and informal learning. She has conducted research for Becta, DCSF, ESRC and European Schoolnet including Gridclub, ImpaCT2, ICT TestBed, and the Primary Schools Whiteboard Expansion Project. She is editor of Learning, Media and Technology.

Towards a sustainable framework for informatics in secondary education

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Abstract

Starting from the influential Common European Framework of Reference for Languages, this paper presents a synopsis of current frameworks and curricula in terms of Informatics education at the secondary school level. Some initiatives from well known organizations and institutions show the global and national efforts to structure the fragmented field of computing at school level. The definitive answer as to whether a perceptible process of harmonization seems to be realistic in the near future cannot yet be given, but there are some positive indicators.

Keywords

Informatics, informatics curricula, framework, standards

Biography



Since 1979 **Peter Micheuz** has been an Austrian teacher of Mathematics and Informatics at the Alpen-Adria-Gymnasium Völkermarkt. Since 2000 he has been in charge of teacher education for Informatics at the Alpen-Adria-University Klagenfurt. His doctoral thesis deals with a survey on Informatics education in Austria's secondary academic schools. As a generalist and digital immigrant he publishes in the domains of Informatics education, standards and E-Learning.

Learning programming with Ruby

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Abstract

Introducing students to the fundamentals of programming can still be considered as a real challenge. The choice of the right programming language seems to play a major role. In this paper we present our experiences with the programming language Ruby in introductory programming classes. Ruby is a relatively young programming language, which provides some very interesting aspects and seems like a very good candidate as a beginner's programming language, integrating the advantages of other languages with respect to learning programming, while still being professional enough to support open-ended learning. We discuss several aspects of Ruby that distinguish it from other languages and which make it a good choice for a beginner's course in programming. In addition, we discuss the approaches applied at two different universities in teaching programming with Ruby. We present in some detail the individual programming exercises and present student results. Finally, we discuss the pros and cons for applying Ruby as a first programming language.

Keywords

Computer Science education, programming, object-oriented design, Ruby, shoes, rails

Biographies



Wolfgang Müller holds a doctorate in Computer Science and is a professor for Media Education and Visualization at the University of Education in Weingarten. He is a German delegate to IFIP TC 3, WG 3.3 "Research on Educational Applications of IT". In addition, he is a co-editor in chief of both the Springer Journal Transactions on Edutainment and the Journal "Notes on Educational Informatics" (NEI).



Ulrich Kortenkamp received his PhD from the Swiss Federal Institute of Technology Zurich in theoretical computer science. In 2006 he became a Professor for Computer Science and Media Education at the University of Education Schwäbisch Gmünd. Currently he holds a position as Professor for Mathematics and Education in Karlsruhe and director of the Centre for Educational Research in Mathematics and Education, CERMAT.

Researching in a confined environment

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Abstract

This paper deals with some of the factors affecting the way research can be carried out in an environment that demands one-to-one teacher-student involvement. These conditions, if the teacher is also the researcher, impose considerable limitations on the research methodology available and inextricably intertwine task and observation. The context here, that of working with old and very old retirees learning to use the Internet, demanded a very personal approach and this determined the philosophies and reliability of the simultaneous research. The word 'confined' in the title therefore refers to the physical environment of the students taking part, and to the research environment itself.

Keywords

Educational research, participant research, action research, life-long learning.

Biography



John Murnane is a lecturer in Computer Education at the University of Melbourne, Australia. He has a long-standing interest in creative roles for the computer in the classroom, and in the old and very old using eMail and the Web.

Uses of blogs and wikis in classrooms and emerging issues for pedagogy and literacy

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Abstract

This paper discusses possible uses of blogs and wikis in classrooms, and examines emerging issues for pedagogies and literacies that surround implementation of these new Web tools in educational practices.

Blogs can be used as class portals, e-portfolios, collaborative spaces for students to collaborate with others online and school Websites. They can be used as motivators for students to read ahead a subject, or for communication between students and their teacher. Possible ways of wikis' use in classrooms include, support of collaborative work, as resources and for production of a course. Collaborative writing (construction of knowledge) among students is a challenge related to the way we think about the content students create.

The potential of these new tools in educational settings, raises some issues for pedagogy and literacy. They can become constructivist tools for learning, they expand classroom walls and pose the need to re-examine the way we think about content, curriculum, students' and teachers' roles. The curriculum could become more open, students who create their own digital content become more active participants in their learning, while teachers could be content creators and collaborators. The explosion of these online technologies relates to the issue of redefining ICT literacy for the forthcoming years.

In parallel, there are potential risks that necessitate for students to learn how to evaluate Web sources for accuracy and trustworthiness, as well as how to be critical thinkers rather than consumers of information.

Keywords

Blogs, wikis, classroom, pedagogy, literacy

Biography



Kleopatra Nikolopoulou works as a science teacher in secondary education and as an adjunct lecturer (ICT in Education) in the Department of Early Childhood Education, University of Athens, Greece. Her research interests include the use of ICT in education and their effects in teaching and learning, teacher training, as well as gender issues and ICT in education.

Is searching self-efficacy related to search performance? A study of university students' web information searching strategies

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Abstract

This paper investigates the information searching strategies while using Internet search engines. A case study was conducted in which 107 University students participated. The number of students who succeeded in completing the task and the expressed search strategies used in terms of the keywords, the length of the search engine queries used and the frequency of the logical operators in the searches carried out, were identified. The obtained results were described in accordance with their search engine self efficacy. This study revealed correlations between perceived result confidence, perceived satisfaction and effectiveness of search processes developed for the completion of the activity. The results showed errors the students commit and misconceptions they have while using information searching strategies.

Keywords

Internet, information searching, search engines, information search strategies

Biographies



Marioleni Parissis is a PhD Candidate. Her main research interests concern information technologies in education, the didactics of informatics and information seeking on the Web. She has been a member of the Information and Communication Technologies in Education (ICTE) Group since October 2005.



Nikolaos Tselios is a Lecturer in the Educational Sciences and Early Childhood Education Department, University of Patras, Greece. His interests are design and evaluation of educational software and distance learning systems, cognitive models and information foraging theory, context-aware learning environments and artificial intelligence techniques for learner/human computer interaction. He has more than 55 publications in international and Greek refereed journals.



Vassilis Komis is an Associate Professor in the Department of Educational Sciences and Early Childhood Education and head of the Information and Communication Technologies in Education Group at the University of Patras. His research interests concern the conception and the development of educational software, the implementation of collaborative systems, the teaching of computer science and the integration of ICT applications in education.

Enhancing time-connectives with virtual reality

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Abstract

This study sought to test the most efficient representation mode with which children with hearing impairment could express a story while producing connectives indicating relations of time and of cause and effect. Using Bruner's (1973, 1986, 1990) representation stages, we tested the comparative effectiveness of VR (Virtual Reality) as a mode of representation on children's production of time-connectives with four other modes of representation: pictorial, oral, signed, and textual. 134 participants aged 4-10, 69 children with hearing impairment and 65 hearing children, divided into two age groups, pre-school and elementary school children, took part in this study. The study examined their ability to express time and cause-connectives, using the different modes of representation.

The findings demonstrate substantial differences in producing time-connectives with the various modes of representation. The leading mode of representation is 3D IVR amongst the hearing children, and signed representation and 3D IVR amongst the children with hearing impairment.

Keywords

Immersive virtual reality, hearing impairment, representation modalities, time connectives.

Biography



David Passig is the director of the Graduate Program in ICT and Education at the School of Education, Bar-Ilan University, Israel. He heads the Virtual Reality Lab and teaches Future Technologies, Educational Futures, and Systems Theory.

Aligning the perceived affordances of new technologies of two user groups, educators and students in the search for enriched learning experiences

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Abstract

In this paper we describe aspects that may usefully inform the Information Communication Technologies (ICT) educational learning environment about strategic ways to include the new technologies of the everyday world into educational settings. We have adopted a social cultural view of the new technologies. Our interest is in the perspectives of two groups of users; both the educator and the student. How does each group perceive the affordances of these new technologies? What do educators assume the student values in ICT? How are students making the best use of ICT? Students valued the practical factors that the technologies afforded them. Students did not perceive that they were being more challenged in their thinking or that their work was of a high standard.

Keywords

Social technologies, higher education, research, teaching

Biographies



Christine Redman is a senior lecturer in The Melbourne Graduate School of Education. Her research examines the place of virtual communication technologies as mediators of science ideas. She analyses the meaning-making processes that people utilise. The methodological approach values discursive practices as indicators of a person's hermeneutic and their lived place.



Jon Pearce is a senior lecturer in the Interaction Design Group at The University of Melbourne in Australia. His research focuses on engagement and interactivity, in both educational and non-educational contexts. His current research interests weave together strands from interactivity, multimedia, engagement, learning and sustainable Human-Computer Interaction.

Hermeneutics revisited: reinterpreting methodology in contemporary ICT learning contexts

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Abstract

Through deep and prolonged engagement with electronic data that represented both the raw data and the method of analysis theoretical frameworks about the ways in which those data could be investigated emerged. This paper describes those frameworks and presents some of the insights about children, learning and education that became apparent through that process of engagement.

Keywords

Research, music, children, methodology

Biography



Nick Reynolds is a lecturer in ICT in Education at the University of Melbourne. His research interests are concerned with children using computers in powerful ways, especially musically, and with uses of ICT in teacher education.

Taking ICT to a new generation of educators: finding connections and disconnections between teacher education programs, government policy and school practice

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Abstract (panel session)

The purpose of this panel session is to engage participants in meaningful dialogue about the current approaches to ICT in education. The panel members wish to share and hear about what is happening in schools, in teacher education and in government policy around the world. In discussing this it is hoped to identify where they intersect and where they don't; where they are similar and where they differ.

In order to situate the discussion, the session will commence with a brief overview of the new Master of Teaching course at the University of Melbourne and how ICT is integrated into it. The overview will look specifically at the subject areas of:

- Primary ICT
- Secondary ICT
- Science and ICT
- Designing Personalised Learning

The university/school partnership arrangement that is of significant importance to this program will also be introduced.

It is the experience of educators in this new degree that too many students are still reluctant to engage in meaningful and effective integration of ICT as part of their pedagogical toolkit. ICT is all too frequently seen as something that is done in labs, is difficult, is an add on, or is time consuming. Many school environments do little to change these attitudes despite a curriculum that articulates ICT as an interdisciplinary domain.

A brief description of government policy will follow with reference to significant government initiatives including, the Digital Education Revolution, the 1:1 Laptop Computing Program, the National Curriculum.

Attendees will be encouraged to participate with accounts of their own experiences. Those participants who submit prepared overviews of their intended contributions will be given preference in this discussion. It is hoped that this will encourage a deep level of discussion and maintain the focus of that discussion.

The session will be recorded (with permission) and the subsequent notes will form the basis of a detailed report to TC3 on the match or mismatch between expectations, programs, policy and the realities of school practice.

Keywords

Teacher education, school ICT, policy, government initiatives

Biography



Nick Reynolds is a lecturer in ICT in Education at the University of Melbourne. His research interests are concerned with children using computers in powerful ways, especially musically, and with uses of ICT in teacher education.

Competence model research on informatics system application

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Abstract

This paper describes the results of competence model research for the domains of informatics systems and modelling at secondary level within the German Research Foundation (DFG) interdisciplinary project "Measurement Procedure for Informatics in Secondary Education (MoKoM)". We initially established a theoretically derived competence model through analysis of international syllabi and curricula. This model exhibited significant differences with respect to the number, structure and definition of competence categories. We refined the model following an expert interview programme involving thirty informatics experts – from the domains of didactics of informatics, computer science and informatics teaching. The results of content analysis of the expert interviews are presented. Qualitative content analysis of scenarios on system application and system comprehension proved components of the preliminary competence model, and disclosed the need for additional competence facets. Critical Incident Technique methodology together with qualitative content analysis established seven new competence components for system comprehension. Further research found that the cognitive and non-cognitive dimensions of system application were mostly underestimated. We identified very important sub categories for both categories. While the emphasis of the paper is on the empirically refined competence model we list, compare and fully discuss the competencies necessary for system comprehension and application.

Keywords

Competence model research, informatics system comprehension, informatics system application, active learning, secondary education

Biographies



Peer Stechert received his diploma in informatics (2005) from the University of Lübeck. Since 2005, he is teaching informatics at the University of Siegen. He finished his PhD in June 2009. His research interests are concepts for understanding of informatics systems in secondary and higher education. He is a member of IFIP Working Group 3.1 Secondary Education and member of the Steering Committee of the Working Group Didactics of Informatics of the German Informatics Society (GI).



Since 1979 **Sigrid Schubert** has taught informatics in secondary, vocational and higher education. She received her diploma in physics, her doctoral degree in informatics and has been professor of "Didactics of Informatics and E-Learning" (Universities Siegen and Dortmund, Germany) since 1998. She is a member of IFIP TC 3 Education, Lifelong Learning (WG 3.8), Higher Education (WG 3.2), vice-chair of Working Group 3.1 Secondary Education.

Analysis of the cyber home learning system (CHLS) researches of Korea

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Abstract

The Cyber Home Learning System (CHLS) is one of Korea's representative e-learning services. It is a learning environment for primary and secondary school students. Since its service began in 2005, the CHLS has been getting popular among the students as well as the teachers. As of August, 2009, 64,535 teachers and 3,119,924 students were using the system, and there have been numerous research projects about the CHLS. The main purposes of this study are to investigate the research trends, to summarize the research findings about the CHLS and to suggest the direction for improving CHLS. Forty-six CHLS-related research papers, which had been published in prestigious journals in Korea from 2005 to the end of 2009, were analysed. The papers were analyzed from the aspects such as the study subjects, topics, and research methods employed. Some of the findings were: 1) the number of CHLS related papers had increased over the years; 2) in terms of the research methods, the studies mainly used the quantitative method such as the experimental methods using the surveys, the factor analysis, and the correlation analysis; 3) for the studies, which used the qualitative methods, relied on the case studies, interviews, and observations methods to collect the data; 4) the most studied research subjects were the elementary school students then the middle school students and the parents, teachers, and administrators; 5) with respect to the research topics, the most frequent ones were the pedagogy and the evaluation; and 6) there were also studies about the combination of various topics as well as the technology and the management related issue. Finally, this study made suggestions to improve the Cyber Home Learning System in Korea by synthesizing the outcomes from the analysis of various aspects of the results reported in the papers.

Keywords

Cyber home learning system, online learning, WBI, meta analysis

Biographies



Jeonghee Seo is a principal researcher of Policy Research Team in Global Cooperation and Research Center of KERIS. Her main research interests are Cyber Home Learning System, Digital Textbook, teacher training, and Web 2.0 in K-12 education. She received her Ph.D. in Science Education in Seoul National University, Korea.



Yang Mi Koo is a teaching professor at Konkuk University Chungju Campus. She is also working as a senior researcher at the Center for Teaching and Learning. Her research interests include the curriculum-based creative problem solving, online learning support system, blended learning, and university educational innovation. She received her Doctorate in Sciences of Education from Université de Rennes 2, France.



Woojin Paik is a professor in the computer science department at Konkuk University Chungju Campus. He is also the head of the computing service at the university. His research interests are use of information technology in education, natural language processing, and information retrieval. He received his PhD in Information Transfer from Syracuse University, USA.



Taejoon Byun is a Director of Student Service Team in Primary & Secondary Educational Information Center of KERIS. His main research interest is Cyber Home Learning System, e-Portfolio, Quality Assurance of e-Learning. He is in his doctoral degree course in the field of Educational Technology in Korea University, Korea.

Informatics education: beyond the opposition between information technology and computer science

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Abstract

Some authors complain that, in many countries, informatics teaching focuses on using computers in classroom rather than learning computer science theory (see for example ISSEP 2010 Proceedings). According to them, "Information Technology (IT) education has replaced Computer Science (CS) education". More deeply, for many authors, concerning what we could call *informatics education*, a clear opposition has to be done between Information Technology (IT) and Computer Science (CS): Information Technology deals with the use of computer and its applications, and Computer Science with the designing of informatics products (or more theoretical objects). This is often connected to another opposition between users and designers with the underlying idea that designers are 'those who know' and users are 'those who don't need to know'. In this paper, we argue that we need to go beyond this dichotomy. First of all, we demonstrate that the opposition between designers and users is not relevant in many cases: end-user programmers, human decisions required in complex interaction loops with computers... Furthermore, we think that the opposition is not desirable in educational terms: a citizen is more than a simple user. The goal for students is then not only a kind of computer literacy, but more some computer fluency and awareness. We will extend the debate beyond educational issues, claiming that informatics as a scientific field cannot be reduced to computer science, some human and social issues having to be included.

Keywords

Informatics education, information technology, computer science, computer fluency

Biographies



Françoise Tort is an associated professor at STEF Laboratory - Ecole Normale Supérieure de Cachan, France. She graduated in economics and management and holds a Ph.D in Knowledge Engineering (Computer Science). Her research interests are in didactics of informatics with a special emphasis on software teaching. She is member of the European Spreadsheet Risk Interest Group (www.eusprig.org) management committee.



Eric Bruillard is professor of computer science at STEF laboratory (ENS Cachan and INRP) in France. His research is devoted to design and use of ICT in education for more than 25 years. He currently is the head of STEF laboratory and the chief editor of the scientific journal STICEF (www.sticef.org).

Factors and processes involved in collaborative learning and problem solving in massively multiplayer online games: aspects of the designed and the social environment

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Abstract

Massively Multiplayer Online Games (MMOGs) constitute virtual environments rich in task-oriented and social interactions among players. These interactions are directed both by the design of the environment as well as by the community of the players. There are strong indications that these environments constitute, beyond of environments for fun, environments of collaborative learning through interactions with peers. Through this paper, we review research in the area of collaborative learning and relate it to relevant findings from the area of research in MMOGs and findings from our own research, in an attempt to formulate a conceptual model for the investigation of collaborative learning processes in MMOGs.

Keywords

MMOGs, collaborative learning, collaborative problem solving, social interactions, online games, collaborative virtual environments, MMORPGs

Biographies



Iro Voulgari is a PhD candidate at the Department of Educational Sciences and Early Childhood Education of the University of Patras



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Online and face-to-face interaction for learning - supporting assessment for learning

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Abstract

A current prevailing view of learning, based on constructivist theories of learning and social cultural theory foregrounds peer interaction including talk. Opportunities provided by new technologies including discussion boards, wiki, application sharing and online chat extend possibilities for talk and other forms of interaction beyond the classroom. Most universities now offer various blended learning opportunities in their provision of higher education. Schools now have virtual learning environments and access to technologies that support online interactions. At the recent JISC conference in London Professor William Dutton, Director of the Oxford Internet Institute in the opening debate commented that we should not do in classrooms things that could be done better online. So when is online teaching and interaction as good as or better than face to face talk? What do we know about interaction involving talk that supports learning in face to face and online situations?

In this session we will attempt to address these questions by drawing on findings from our research over recent years that has investigated interaction in both face to face and online settings. We will also invite you to discuss and to draw on your own experiences of developing courses and/or researching interaction in order to make sense of what is known.

Specifically the research that we will draw on includes analysis of classroom practice in primary schools where formative assessment is embedded (Webb & Jones, 2009), research on technology enhanced learning using formative assessment with beginning teachers (Webb, 2010 (in press)), development of a blended learning MA in e-learning and analysis of the AskNRICH space where anyone of any age and from any place can ask an 'expert' for assistance with any mathematical problem (Jared, 2008, 2010).

The issues are clearly complex. On our blended learning MA course students appreciate the flexibility of being able to undertake most of their course from home and are very enthusiastic about working and collaborating online. In our work with beginning teachers while they used a wide range of digital tools for communication and collaboration they all agreed that they preferred to meet and work face to face wherever possible. Many other studies support the view that students generally prefer face to face interaction. Our work that focused on formative assessment in pedagogy has identified that teachers are engaged in careful planning and interaction to "engineer" learning situations that enable appropriate peer interactions to support learning. The framework developed by Black and Wiliam (2009) shown in Figure 1 helps to characterise formative assessment in these face to face settings. The work of Jared (2008, 2010) on the other hand suggests that learners can support each other very effectively in an informal setting with little teacher intervention and the interactions evident on the discussion board are often formative. The need for 'engineering' by a teacher appears to have been removed, perhaps replaced by a combination of learner motivation and expectations of participating in the AskNRICH space.

So what are the implications of the broadening opportunities for peer interaction?
How important could peer interaction in learning become?

	Where the learner is going	Where the learner is right now	How to get there
Teacher	1 Clarifying learning intentions and criteria for success	2 Engineering effective class-room discussions and other learning tasks that elicit evidence of student understanding	3 Providing feedback that moves learners forward
Peer	Understanding and sharing learning intentions and criteria for success	4 Activating students as instructional resources for one another	
Learner	Understanding learning intentions and criteria for success	5 Activating students as the owners of their own learning	

Figure 1: Aspects of formative assessment (Black & Wiliam, 2009)

Keywords

Peer interaction, talk, web 2.0 applications, online teaching, face-to-face teaching

Biographies



Mary Webb is Senior Lecturer in Information Technology in Education at King’s College London and Director of the secondary PGCE ICT course. Mary has developed and researched the use of ICT in learning and teaching since computers first appeared in schools and has taught ICT and Science in secondary schools and all subjects in primary schools.



Libby Jared is a lecturer in mathematics education at the Faculty of Education, Cambridge University. As one of the co-founders of the NRICH mathematics project, my main research interests focus on the potential educational changes, within the teaching and learning of mathematics, that can result from the current modern technologies.

Technology mediated feedback processes in formative assessment with beginning teachers

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Abstract

By drawing on findings from two distinct strands of research this paper addresses the questions: What perceptions do pupils and teachers have of the nature of feedback processes in formative assessment and their value for learning? How can technology support the interactions and feedback processes of formative assessment? What models of pedagogy involving formative assessment are emerging? The first strand focused on case studies of classes where experienced teachers had embedded formative assessment practices into their teaching. The second strand was a study with pre-service teachers that set out to investigate how a range of technologies could be integrated into pedagogical practices that emphasised formative assessment and how the technologies supported and enabled these approaches. Methods included structured lesson observations, structured teacher interviews, student focus group interviews, informal discussions, questionnaires and scrutiny of lesson plans and students' work. Findings were analysed using a framework derived from activity theory. The findings revealed complex pedagogical sequences incorporating feedback processes. Furthermore technologies provided a range of tools that can be deployed by teachers as they engineer situations for students to learn and to develop as autonomous learners. The tools mediate the feedback processes and can extend and support teacher and peer feedback. Planning and engineering these sequences of activities and deployment of these mediating tools requires sophisticated pedagogical reasoning by the teachers using their developing pedagogical knowledge. These are significant challenges for beginning teachers but are central to their development as teachers.

Keywords

Pedagogy, pre-service teachers, formative assessment, feedback, classroom teaching, primary education, teaching methods, teacher education

Biography



Mary Webb is Senior Lecturer in Information Technology in Education at King's College London and Director of the secondary PGCE ICT course. Mary has developed and researched the use of ICT in learning and teaching since computers first appeared in schools and has taught ICT and Science in secondary schools and all subjects in primary schools.

School ties: keeping students with chronic illness connected to their school learning communities

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Abstract

Participation in their school community provides children and young people with opportunities for interaction and collaboration, benefiting them educationally and socially. Their involvement and sense of belonging can be disrupted significantly by the experience of chronic illness, not least because of prolonged or recurrent absence from school. Given that there are increasing incidence of and survival rates for chronic illness, schools are more likely to have students who are enrolled but are absent from lessons for significant periods of time owing to a chronic health condition. Helping these students stay connected to their school communities - strengthening their school ties - is essential, not only for psychosocial reasons, but to minimize their educational disadvantage and the impact on their quality of adult life and employment prospects.

Although on-site hospital schools seek to address the educational needs of hospitalized children and young people, decentralized healthcare and improved medical treatment mean that they have less access to those students who are only hospitalized for short periods of time and receive treatment or recuperate at home. Out of the reach of hospital schools, these students also may not be attending their own schools, increasing the likelihood of disconnection and isolation.

Children and young people themselves have indicated their social and academic concerns about absence from school and their desire for maintaining connections with their teachers and peers. Increasingly flexible communications technologies, such as videoconferencing, online whiteboarding, and interactive whiteboard (IWB) application sharing, provide opportunity for facilitating such connections. This paper describes the investigation of technology-mediated communication between students and their schools in the context of a research project funded by the Australian Research Council and in its third year of data collection across a number of schools in the state of Victoria. It explores some of the impediments to the successful implementation of technologies, highlighted by a collective case study of several students and their teachers. It presents a model for the linear and cyclic process of connection between students and teachers. Data suggest that ambiguity about their role and management of communications technologies in a school setting are significant challenges for teachers who have a student absent for significant periods owing to chronic illness.

Keywords

Technology-mediated communication, school absence, chronic illness, educational continuity

Biographies



Karina Wilkie is a PhD candidate at the University of Melbourne, Australia. She holds a Master of Information Technology from Deakin University, Australia. She has a career in primary, secondary and tertiary education and in educational consultancy. Her research interests include mathematics teaching and learning, curriculum design, and technology-facilitated teaching and learning.



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