

**ICT-supported learning and special educational needs:  
An introduction to the virtual issue**

*A/prof. Dr. Andreja Istenic Starcic, University of Ljubljana & University of Primorska  
Slovenia, Macquarie University Sydney, Australia*

The field of ICT-supported learning of people with special needs is facing the issue of how to design special ICT-supported learning environments, solutions and tools that meet their needs, preferences and accessibility requirements and address various needs, preferences and accessibility requirements within universally designed learning environments and learning provisions. This 'virtual' special issue of *BJET* brings together a number of papers previously published in the journal, as a convenient resource for researchers and practitioners in this field. An extensive literature review of SSCI journals in educational technology and ICT-supported learning showed that the *British Journal of Educational* technology had the most published articles and the best of these have been selected for this special issue.

The use of ICT to support students with special needs in their learning and social participation has been the focus of studies for decades. The assistive function and enabling roles of ICT have been widely investigated with regard to cognitive difficulties, emotional difficulties, physical disability and sensory disability. ICT can foster independence, social participation and reduce a person's handicap in learning and/or life. But the question of *how* ICT facilitates inclusion processes and access to mainstream educational provision addressing curriculum and teaching and learning contexts still has to be addressed. Inclusive education based on equity and human rights will remain inconclusive if teaching and learning design does not support students' engagement and their optimal development.

Supporting the learning of people with special needs using ICT will be the preserve of experts until the design of inclusive learning environments involves teachers as creators in mainstream educational contexts. In this virtual issue we hope to inform teachers and practitioners in their day-to-day practice.

A review paper by Andreja Istenic Starcic and Spela Bagon (2013) examines the accessibility of ICT-assisted learning and how ICT-supported learning facilitates inclusion. The review of papers published during period of 1970 to 2011 looks at findings presented in terms of ICT intervention; disability groups; groups of study participants by relationship with ICT; and research design, together with trends in published studies in terms of mainstreaming and inclusion.

The use of a personal home page by adults with Down's Syndrome has been investigated by Jane K. Seale (2001), adding to the investigation of identity construction and perception of self-identity. The paper focuses on the design of the home page supporting the process of managing identity through narratives of self.

Web content accessibility guidelines are examined by Neil Witt and Anne McDermott (2004). Two thousand two hundred web sites in the UK were analysed in 2002 by the authors, who

identified that 65% of international web sites and 58.75% of academic web sites meet the relevant criteria.

Lynda Lewis, John Trushell and Pat Woods (2005) investigated computer-supported collaborative learning as social and learning support to facilitate mainstream inclusion. They looked at the interaction of three schoolboys with Asperger's Syndrome with their peers, identifying the improvement of their interaction for social and task-related purposes.

Alan Bain and Robert John Parkes (2006) present a study on learner diversity by differentiated instruction. They investigated the use of a curriculum-authoring tool which supports differentiated instruction by providing:

- the design of authentic assessment tasks and resources;
- the planning and delivery of lessons;
- the compilation of multimedia and learning resources and launching them from the application;
- implementation of portfolio items;
- the organisation of group rotation in a multilevel classroom.

Sarah Parsons, Harry Daniels, Jill Porter and Christopher Robertson (2006) examine the use of ICT to promote community participation in a day care centre for adults with learning difficulties. The use of ICT in a day care centre by adults with learning disabilities was grouped into three categories: decision-making and independence; leisure and creativity; and communication and literacy. ICT was used for a number of different aims, including leisure, communication, education, interaction, creativity and recording.

James Hartley (2007) in his review article investigates teachers' use of ICT, reviewing its effects on teaching and learning. He focuses on the five teaching situations of direct instruction, adjunct instruction, facilitating the skills of learning, facilitating social skills and widening learners' horizons. The paper examines the settings of primary schools, secondary schools, higher education, special education and out-of-school.

Marjolijn Peltenburg, Marja van den Heuvel-Panhuizen and Brian Doig (2009) present an ICT-based assessment including a dynamic visual tool supporting students with special needs in solving mathematics problems. ICT-based assessment, integrated with a dynamic visual tool, reveals weak pupils' learning potential and strategy use.

Katerina Mavrou, Ann Lewis and Graeme Douglas (2010) investigate computer-supported collaborative learning in an inclusive classroom. The study revealed the positive impact on group dynamic in the classroom. It facilitated conversation, interaction and participation, promoted various interaction styles and provided opportunities and motivation for student engagement.

Andreja Istenic Starcic, Mara Cotic and Matej Zajc (2013) present a design-based research study which was conducted to identify how students, including those with low fine motor skills and those with learning difficulties, develop geometry concepts when learning using a tangible user interface (TUI) combining cognitive and physical representations. A relationship between diverse students' needs and geometry concept learning in relation to computer-

supported learning by TUI was discovered. Two dimensions were identified: (1) TUIs support concept development, with physical and virtual representations based on dynamic geometry assisted by a TUI; (2) TUI manipulative properties support students who have low motor skills and difficulties in their geometry learning as well as in their inclusion in classroom activities.

Finally, Fengfeng Ke and Tatiana Abras (2013) investigate key design features related to creating game-based learning and engagement for students with special learning needs. The study examines academic disadvantages due to learning difficulties, lower socio-economic backgrounds or linguistic and cultural differences. Their review of findings informs educational game designers and teachers on how to promote and support game-based learning for children with special learning needs.

*Andreja Istenic Starcic*

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