The main research question in this area is how to design instruction in ways that best fit the known strengths and limitations of the human mind. The research group is particularly interested in investigating cognitive load issues in science and maths education, language learning, as well as developing new approaches to enhancing formative assessment and technology-enhanced environments.

This program currently involves Professor Slava Kalyuga, Emeritus Professors John Sweller and Paul Ayres, Postgraduate Teaching and Research Fellow Anne-Marie Singh, 11 PhD students, and 1 Honours student.

Cognitive load theory (CLT) is an instructional theory derived from our knowledge of the evolutionary bases of human cognitive architecture. It has generated a large range of instructional effects that can be used by teachers, instructors and researchers. The research in this area focuses on cognitive processes relevant to learning, instruction, and instructional design. CLT is used widely around the globe by numerous groups of researchers. It is recorded as being cited on many of thousands occasions by all of the common citation indices and is clearly on a massive upward trajectory.

Focus

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International Engagement

CLT researchers have published with international collaborators from France (Toulouse), Germany (Freiburg, Tuebingen, Essen-Duisburg), Netherlands (Erasmus, Maastricht, Open University), Hong Kong, Macau, Taiwan, Switzerland (Berne, Zurich), and the United States (Florida State, New York University, Carnegie-Mellon, Southern California, UCLA, UCSD), and in Australia with researchers from Macquarie, Sydney, Wollongong, and UWS.

Many of these ties have been strengthened at the annual cognitive load theory conference. Ayres, Kalyuga, and Sweller have been members of the Organising Committee of this conference. It was first conducted at the UNSW in 2007. The following conferences were conducted around the world: 2008 – Wollongong, Australia. 2009 – Heerlen, the Netherlands. 2010 – Hong Kong. 2012 – Tallahassee, USA. 2013 – Toulouse, France. 2014 – Taipei, Taiwan. 2015 – Fort Collins, USA.

Impact

In 2009, UNSW had the world’s 3rd highest number of citations in the area of instructional design. Of the five most highly cited papers, four were concerned with cognitive load theory. Ayres, Kalyuga, and Sweller were among founding members of the International Cognitive Load Theory Association, established in 2014. They received a best paper award at the European Association for Research in Learning and Instruction conference in 2012. The academics have published two books, more than 20 book chapters, and more than 60 refereed journal articles since 2008. Sweller and Kalyuga were ranked among the world’s 10 most productive educational psychologists (2003-2008). Ayres, Sweller and Kalyuga have been members of editorial boards of Journal of Educational Psychology, Educational Psychology Review, Learning and Instruction, Applied Cognitive Psychology, Learning and Instruction, and have edited special issues on CLT in leading international journals.

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