Critiquing constructivist theory: (Mis)aligned (mis)application of constructivism in online learning environments

Barney Dalgarno
School of Education
Charles Sturt University

Gregor E. Kennedy
Faculty of Medicine Dentistry and Health Sciences
The University of Melbourne

Mark J.W. Lee
School of Education
Charles Sturt University

The focus of the symposium will be a critical exploration and examination of the nature of constructivist theories of learning and their consequences for the design of online learning resources and environments. Further detail about the theoretical frameworks and research studies that will be covered in this symposium are outlined below.

Keywords: constructivism, online learning, learning resources, pedagogy

Introduction

This symposium will critique the dominant theoretical paradigm associated with teaching and learning today: constructivism. By examining constructivism's underpinnings, the presenters will address ideas familiar to ascilite delegates such as student centredness, authentic learning environments, active learning and discovery-based learning. This symposium aims to attract an audience by proposing to show how these ideas relate to the way ascilite delegates design learning resources, and how they underpin their learning and teaching practice. By taking a critical and at times provocative approach to the way we conceive of and apply constructivism, the presenters will spark interest and engage delegates in lively and energetic discussion.

Symposium format

The symposium will comprise three short presentations (5-10 minutes each) and a summary presentation (5 minutes), followed by a discussion forum (30 minutes).

Mark J.W. Lee
The symposium will begin with an overview from Mark J.W. Lee of prevailing ideas about constructivist learning theory and their implications for the design of online learning resources and learning activities. Mark will propose that constructivist learning theory is fundamentally underpinned

by three key tenets: (i) that each person forms his/her own representation of knowledge (see, for example, von Glaserfeld, 1984; Hawkins, 1994); (ii) that people learn through active exploration (see, for example, Bruner, 1962; Piaget, 1973); and (iii) that learning occurs within a social context (see, for example, Vygotsky, 1978). Mark will focus on the first two of these tenets, which are of critical importance in the design of learning resources and environments (as distinct from the design of collaborative learning activities, which would draw much more heavily on the third tenet). Mark will propose that these two tenets can be applied through four broad principles, namely that learners should:

1. have some control over what they attempt to learn;
2. have some say in the methods of teaching and learning employed;
3. undertake activities enabling them to discover principles for themselves;
4. undertake activities that allow them to put new understandings and new skills into practice in realistic contexts.

The nature of learning resources that align with these principles will then be discussed.

Barney Dalgarno
Associate Professor Barney Dalgarno will provide the first critique of these prevailing ideas, and will discuss interpretations of the concept of active learning. He will suggest that many have misinterpreted Piaget (and others) and have focussed on behavioural activity rather than cognitive; that the results of studies (some of which will be summarised as part of his presentation) show many examples where behavioural activity results in no improvements in learning and sometime makes things worse; and that Piaget's own words can sometimes be confusing in this respect (excerpts from Piaget will be examined). This argument will conclude with three warnings: first, that the value of active learning tasks depends on 'task alignment' (unaligned tasks will not result in intended learning), which builds on Biggs' concept of constructive alignment (see, for example, Biggs & Tang, 2007); second, that scaffolding is important to avoid the problems of pure discovery learning as pointed out by Mayer (2004); and third, that cognitive load issues need to be taken into account in trying to present tasks with all of the complexity contained in the authentic tasks on which they are modelled (see, for example, Sweller, van Merriënboer & Paas, 1998).

Gregor Kennedy
The second critique will be presented by Associate Professor Gregor Kennedy, and will focus on exploration in simulated learning environments and the principles of discovery-based and authentic learning. Gregor will argue that immersive simulated learning and training environments are often seen as a universal 'good' because they authentically represent or approximate the real world and are designed to promote (guided) exploration, consistent with a cognitive apprenticeship model. However, the designs of learning tasks used within these environments routinely share many characteristics of the derided drill-and-practice activities of the 1960s and 70s: repetition, lock-step levels of achievement, and positive and negative reinforcement. Using examples from science, surgery and aviation instruction, Gregor will suggest that these learning designs are well supported by the notion of 'deliberate practice' from the expertise literature (see Ericsson, Krampe & Tesch-Römer, 1993), which is *not* well aligned with the prevailing constructivist view, but has been shown to be an effective learning and teaching strategy. He will conclude by asking the audience to reflect on how the learning outcomes desired of students may legitimately steer learning designers and educators away from the prevailing constructivist view.

Summary and interactive discussion forum
Mark J.W. Lee will draw together the three presentations by providing a summary and noting the key points of departure from the 'prevailing view'. The summary will question whether, after a period of broad acceptance, we are seeing a pendulum swing back to a fundamental questioning of constructivist theories, or simply a reassessment of their prevailing interpretation. This important question will be put to the audience for comment and debate. Example learning designs of online learning resources and environments will be used to both provoke discussion and debate among participants and to provide a practical anchor for the discussion.

Audience and expected outcomes

The target audience will be a core constituency of the diverse ascilite community: educators, educational and instructional designers and developers, curriculum developers and teachers at the coalface, and academic developers. The content of the symposium will also be of interest to

policymakers and researchers in the area of educational technology. The primary goal will be to challenge audience members to think clearly about the theoretical underpinnings of their work. By critiquing constructivism and exposing alternative views and interpretations of it and beneficial learning environments the presenters hope to provoke reflection and encourage members of the ascilite community to assess their own assumptions about educational technology theory and practice.

References

Biggs, J. & Tang, C. (2007). *Teaching for quality learning at university* (3rd ed.). Maidenhead, UK: Open University Press/McGraw-Hill.

Bruner, J.S. (1962). *On knowing: Essays for the left hand*. Cambridge, MA: Harvard University Press.

Ericsson, K.A., Krampe, R.T. & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, 100(3), 363-406.

Hawkins, D. (1994). Constructivism: Some history. In P.J. Fensham, R.F. Gunstone & R.T. White (Eds), *The content of science: A constructivist approach to its teaching and learning* (pp. 9-13). London: Falmer.

Mayer, R. (2004). Should there be a three-strikes rule against pure discovery learning? *American Psychologist*, 59(1), 14-19. https://doi.org/10.1037/0003-066X.59.1.14

Piaget, J. (1973). *To understand is to invent: The future of education*. New York: Grossman.

Sweller, J., van Merriënboer, J.J.G. & Paas G.W.C. (1998). Cognitive architecture and instructional design. *Educational Psychology Review*, 10(3), 251-296. https://doi.org/10.1023/A:1022193728205

von Glasserfeld, E. (1984). An introduction to radical constructivism. In P.W. Watzlawick (Ed.), *The invented reality: How do we know what we believe we know?* (pp. 17-40). New York: Norton.

Vygotsky, L.S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Presenter contact details:
Barney Dalgarno
School of Education
Charles Sturt University
Email: bdalgarno@csu.edu.au

Gregor E. Kennedy
Faculty of Medicine Dentistry and Health Sciences
The University of Melbourne
Email: gek@unimelb.edu.au

Mark J.W. Lee
School of Education
Charles Sturt University
Email: malee@csu.edu.au