

Using Distance Education Technologies and Strategies to Deliver CDIO Programs.

Authors and Affiliations

Contact person:

Clive Ferguson

School of Engineering and IT, Deakin University, Australia

Email: clive@deakin.edu.au

Other Authors:

Peter Goodhew

Department of Engineering, University of Liverpool, UK

Mark Endean

Department of Materials Engineering, Open University, UK

Lyn Brodie

Faculty of Engineering and Surveying,

University of Southern Queensland, Australia

Stuart Palmer

Institute of Teaching and Learning, Deakin University, Australia

Matt Murphy

Department of Engineering, University of Liverpool, UK

Type of Presentation

Active paper (15 – 20 minutes)

Short Description

Developing a CDIO approach to proximal engineering programs is challenging but achieving this through distance or flexible delivery is an even greater challenge. As a first step, this paper investigates how various distance based teaching strategies and education technologies can be adapted to meet the aims of CDIO.

Relevance of the Conference Theme, Strands, and/or CDIO Initiative

The strand that this presentation most closely relates is Technology-enhanced learning.

Abstract

CDIO programs are rich in authentic design-implement experiences and feature active and experiential learning. For proximal delivery they use engineering workspaces that encourage hands-on learning. Thus the concept of using distance education to deliver engineering programs that satisfactorily meet the aims of the CDIO approach provides significant challenge.

However over the last decade and a half there have been extensive developments in the technology and teaching methods used in distance and flexible delivery of engineering education programs. These include extensive use of on-line and computer based technologies and of media such as DVDs. These technologies have been used to deliver a range of educational outcomes including the development and reinforcement of the conceptual knowledge base, as well as skills in engineering experimentation and teamwork. Further, as the Washington Accord professional engineering bodies have switched the focus of their engineering course accreditation requirements from course content to graduate attribute outcomes, all engineering programs, including those through distance education delivery, all engineering programs have shifted much closer to the aims of CDIO.

As the first stage of a program to develop distance based engineering education programs that follow the CDIO approach, the authors present a range of developments in the distance education delivery of engineering education and discuss how they can be used or adapted to support the aims of CDIO. From this, initial points of weakness in the distance delivery of CDIO programs are identified for future investigation.

Active presentation techniques

The proposed active presentation technique is essentially a brainstorming type approach to enable the authors to draw on the expertise and ideas of the delegates.

Using computer projector (PowerPoint):

After introducing the project and the distinguishing features of the 3 distance education providers involved in the project, the range of distance education developments covered in the paper - technologies and teaching strategies - will be quickly outlined.

Using flip charts and clickers:

The presenter will then list as headings on separate flip charts (pre prepared if possible) the perceived difficulties in satisfactorily delivering key aspects of CDIO by distance education as determined by the six authors. The audience will then be asked to suggest other potential difficulties (as headings on subsequent flip charts). They will then be asked to brainstorm strategies to overcoming each of the potential difficulties. Clickers will then be used to enable the audience to provide opinion on the potentially best strategies.

Facilities/equipment required

- Computer projector
- Flip chart and pens
- Clickers