January 31, 2019 - February 12, 2019

Presentations and Workshops by Professor Richard Kimbell

University of London, Goldsmiths College

Workshop 1 2 hrs approx 25 participants

Design Thinking in action

Designing involves bodies of knowledge and sets of skills, but at its heart is an apparently messy process of creativity as learners take the same task and pursue it in very different ways and in different directions. Decision-making in a state of uncertainty is a key skill, both for students and for faculty. Participants (individually and in reference groups) will undertake a short pencil / paper problem-solving activity that will be used to reflect on the nature of designing and problem solving from various points of view. In particular we will consider the pedagogic strategies, the opportunities and the problems of encouraging risk-taking behaviours with learners.

Workshop 2 2 hrs max 40 participants

Performance Assessment: validity, reliability, manageability

In STEM, whilst assessments will typically include conceptual knowledge tests, the core assessments are of performance. Can the student tackle and solve the problem and build an imaginative and convincing prototype solution? Assessment then includes the portfolio of development as well as the fully evaluated prototype solution. There are three challenges for any assessment: (i) that it should be valid, ie it should measure what it purports to measure; (ii) that it should be reliable, ie repeatable … so that different judges arrive at the same outcome; (iii) that it should be manageable, ie do-able in the studio/workshop/exam hall. Too often the demands of reliability and manageability force faculty towards multiple choice testing and this invariably compromises validity. Project work assessment boasts higher validity, but reliability is problematic – even when using extensive rubrics. In the last 10 years, research has shown the value of comparative judgement as a simple and effective approach to all three dimensions of performance assessment. Participants will experience the comparative judging process using existing portfolios to arrive at a rank of quality and - in discussion - we will consider the application of this methodology in education.

Lecture presentation No 1 45 mins + 15mins questions

Design thinking and portfolios: conversations in practice

Thinking becomes clearer as we express it. We talk to someone, make notes, create sketches, make models. All these externalizations are our attempts to take our often vague and hazy early ideas out of our heads and make them explicit. These expressions are helpful in allowing others to see what we mean, but their main value is in helping us to see our own ideas. To feel, see, hear, measure, taste and smell them. These externalizations of learners' thinking are traditionally captured in portfolios. But what are they – and what are they for – and how do they 'work'? Portfolios have many purposes, but at its best a portfolio is a conversation of the student with him/herself. Maybe I'll do that … it might be better if … I wonder if … how might I … ? For faculty, students' portfolios are our means of access into the thinking process that the students are experiencing. If for no other reason, this is why portfolios have become such a critical element in the assessment of students' performance.

Lecture presentation No 2 45 mins + 15mins questions

Structuring engineering tasks for enhanced learning

Engineering tasks are always different. Of course they are different in content (a bridge / a roadway / a building / a vehicle) and this content goes a long way to determining the bodies of knowledge and sets of skills that might be helpful in tackling it. But even within a particular task there are critical elements that determine how complex it is and the key one is context. Defining the context (including all the user dimensions) is a complex job in itself, and in a learning environment we must decide how much of this is to be pre-determined and how much is to be left open for students to decide for themselves. And beyond context lie other areas of task control where the teacher can use a number of pedagogic interventions to support learners' performance. At every stage the variables must be understood not just in engineering terms but also in learning terms. If the principle of … 'from the known to the unknown' is to apply for learners, then faculty must understand how to manage the multiple learning variables in engineering tasks.

Lecture presentation No 3 45 mins + 15mins questions

Assessing learners' performance in design, engineering and technology

Whilst project work assessment is appropriately seen as an ideal form of assessment, it is full of complexities, not least ensuring fairness and that students are working on a level playing field. It is understood that timed written examinations are based on the level playing field, but can the concept be stretched to include extended project work, where diverse portfolios become the focus of scrutiny? Can the creative process of engineering and design be captured in structured portfolios and assessed with sufficient precision (reliability) to allow awarding organizations to trust the assessment judgements being made. We shall explore the history of approaches to assessing project work and, with reference to theories of judgement-making, we will examine comparative judgement as a means for deriving high reliability with complex, multi-dimensional portfolios. The technical and user limits of the approach will be discussed.

Lecture presentation No 4 45 mins + 15mins questions

Assessment as a positive learning process: developing students' connoisseurship.

Assessments are typically what students have done to them. But students need to know where their strengths are, and where any perceived weaknesses lie. So what if students become the assessors, both in teams and as individuals? Can students be expected to make informed and self-critical appraisals of their own performance? This possibility has been the subject of systematic research in higher education, in high schools, in junior high schools and in many countries. And the universally agreed outcome has been that not only can they do it, but that they learn from it very quickly. This is a matter of students learning to become connoisseurs of performance; what it means for performance to be poor, adequate, good or excellent in design, technology and engineering. Such understanding is the bedrock from which students can progressively enrich their performance.
