

Involving Students in the Learning of Structural Concepts –

12 June 2013

33 lecturers from the following education establishments attended the seminar:

Bath University

Cardiff University

Coventry University

Dublin Institute of Technology

Glasgow Caledonian University

Jacobs UK

Lincoln College

Liverpool John Moores University

London South Bank University

Loughborough University

Nanjing University of Science and Technology

Nottingham Trent University

University of Birmingham

University of Manchester

University of Leeds

University of Bolton

University of Dundee

University of East London

University of Leeds

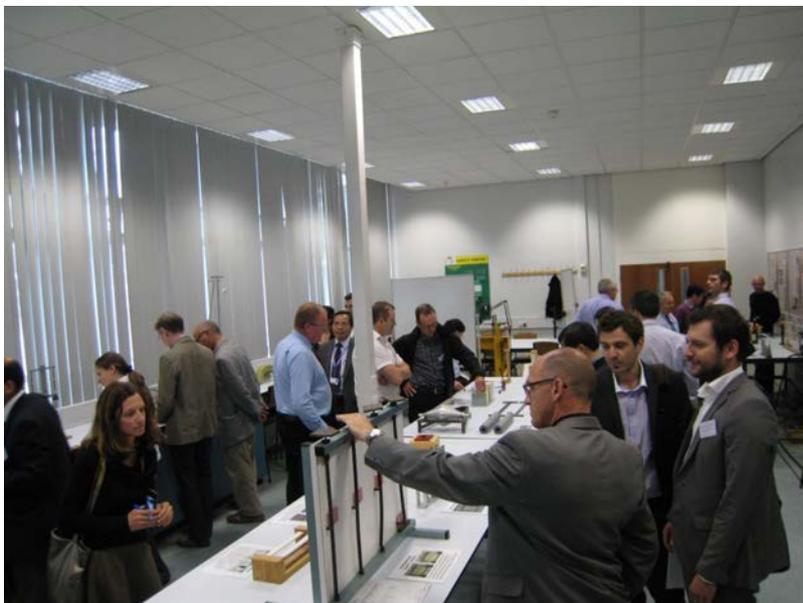
University of Plymouth

University of Salford

University of Sheffield

University of South Wales

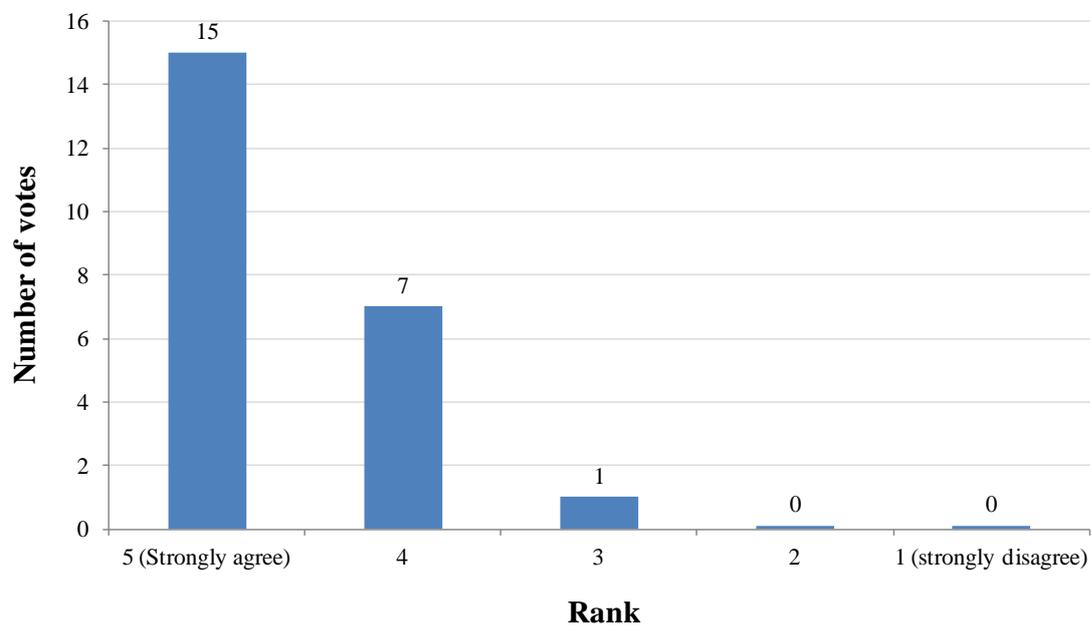
University of Strathclyde



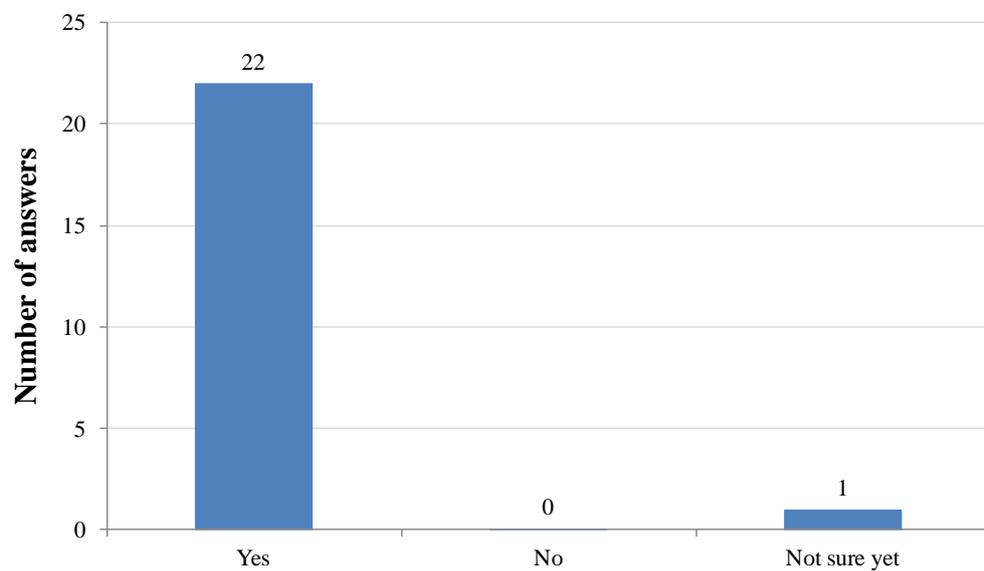
This photo shows delegates visiting the Brotton teaching laboratory where they were able to view and experience the structural teaching models.

Seminar Questionnaire Results

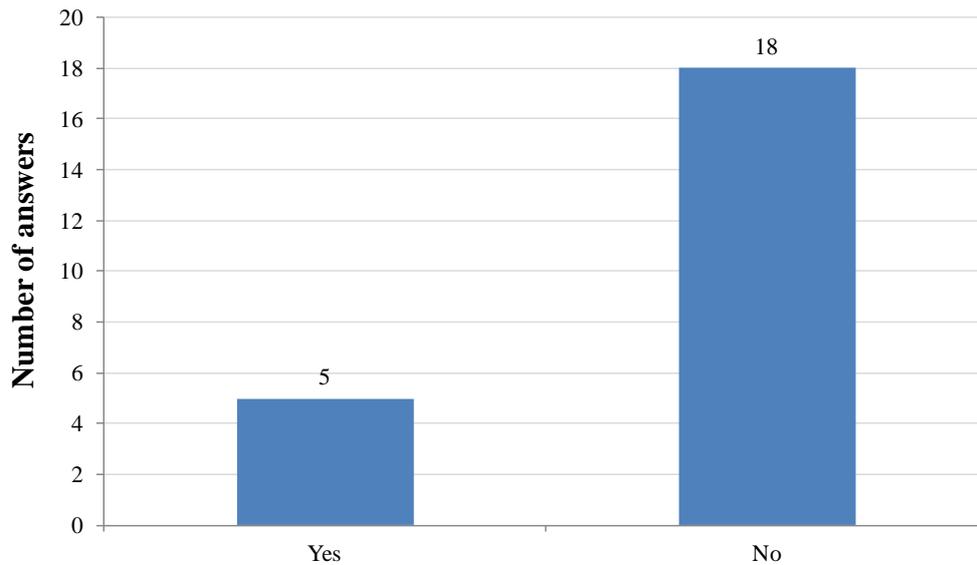
Has the seminar been useful to you?



Will you consider using the material provided in the seminar in your teaching?



Have you used our web contents in your teaching?



Comments:

- No, but I might do in future.
- No, not yet (3 delegates).
- No, but I will use.
- No, but intend to do so next academic year.
- Yes, for beams, phone book (shear).
- Yes, many times. I always refer to it to my students. It is one on the learning resource list given to my MSc students.

Do you have any suggestions for further work on this topic?

- I agree that it would be useful to continue to share ideas and resources and
- Forum to exchange ideas.
- We need to find a way to show/disseminate our resources.
- A dissemination seminar where the participants present their own practice.
- Live structural monitoring - strain gauge a building to demonstrate.
- Combination of structural concept behaviour with computer simulation to do the comparative study between the two.
- Liaise with other universities and eventually create a database of examples of physical models to be used in teaching.
- Keep updating the website, adding more models, practical examples.
- More direct list/ references between physical models and concept development
- The final slide showed the 3 key structural statements: equilibrium, material properties & deformation - perhaps design/build ability/construction should be the fourth – Wembley arch.
- With my final year students they build a "structural" model of a building, usually a particular type of structure - e.g. Bridge, stadium, tall building. The model does not have to reflect the aesthetics of the

structure but it must demonstrate how the structure behaves when subjected to lateral/vertical load. The students work in pairs and present their model to a judging panel of academics & practitioners. This project contributes significantly to the final module mark: 28% and the module is worth 10 ECTS.

- It would be interesting to see the expansion of the concepts approach devoid of any numbers and some of the more complex theory using it purely for practical understanding -> 1st year?
- Conceptual -> Quantitative measurement. It's possible to make some models commercial?
- Continuous dissemination. Open website to contributions from other institutions?

Further comments

- Thank you for a stimulating day.
- Very useful.
- Embrace new technology to show and motivate students.
- An extremely stimulating and enthusing/inspiring day. Many thanks.
- More information on students' assessment, particularly in exams. Have you evidence of student performance and engagement improvement?
- Keep up the good work.
- Very good, informing seminar, with a lot of useful examples I will use in my own teaching.
- Thought provoking day - very interesting. Many thanks.
- This was an enjoyable, thought provoking and informative day. Thank you.
- Collecting ideas on the website is great. Is there a comments/message/ideas section people can put ideas forward for general use? Great ideas, excellent day. Thank you!
- Excellent physical models for demonstrating many difficult structural concepts. Will consider in my teaching in the future.
- You have done very good job. Really appreciated.
- Lots of good ideas for helping students to think about how structures work on a conceptual level. Will hopefully be very useful in helping students make the transition from structural interpretation to structural design. Also gives students a chance to develop the skills needed to explain structural concepts to other members of the design team/the general public.

Notes form delegates via email:

Norman Seward:

"The very good lecture series I mentioned by Prof Ressler is still available at the bargain price of 70 dollars! It is a great introduction for level 4 students and had lots of real life examples of structures to illustrate engineering concepts. You may wish to share with other delegates in the follow up mail?"

http://www.thegreatcourses.com/tgc/professors/professor_detail.aspx?pid=410

Andrew Briggs: Design is more than just calculations, with the following explanation:

“You were encouraging others to share their own work, so I felt that I should send something on to you. The main theme of my teaching is 'design' and I teach in all years of our 5 year MEng course. The attached hand-out is the first of a series which starts in 1st year and runs through to 5th year. It is not specifically about structural concepts, but that is one of the topics within the series. One of the delegates at the Q&A session at the end mentioned the problem of bright numerate students disliking open ended problems. One of the aims of this hand-out is to tackle that situation, i.e. to emphasise the process of 'confusion, conscious, unconscious thinking' used by engineering designers so that from the first few weeks at university, it becomes accepted that an ability to deal with 'confusion and uncertainty' is essential. I then use this as a basis from which to develop various skills which help students to escape from the confusion and uncertainty bubble. This includes how to apply their knowledge of engineering science and materials to understanding structural behaviour using both quantitative and qualitative approaches.”