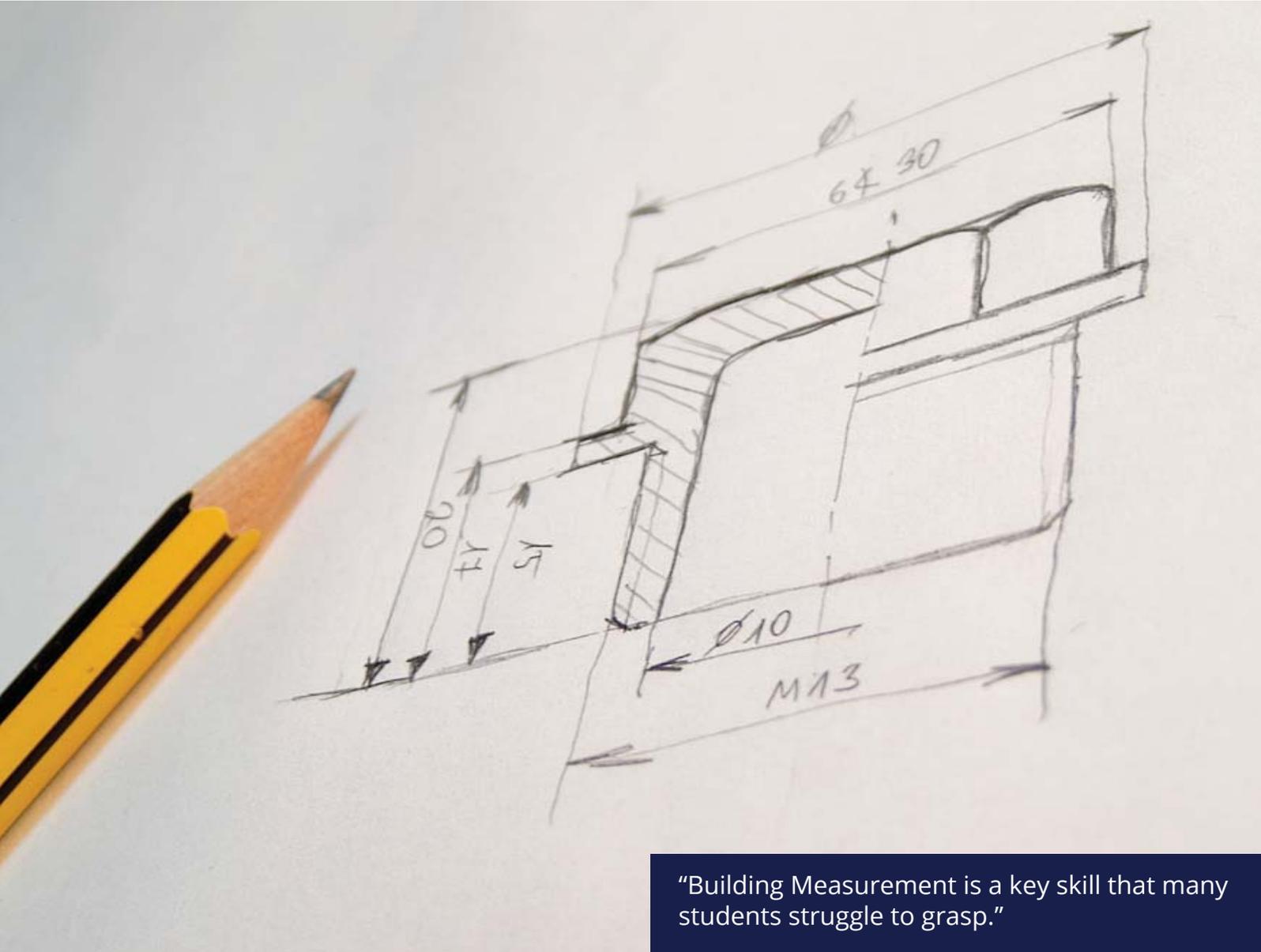


Rick Best

Using the Flipped Classroom to Teach Building Measurement



“Building Measurement is a key skill that many students struggle to grasp.”

Building measurement is a key skill for construction people. Students typically don't like it and many struggle to grasp the concepts particularly when they first encounter the subject.

Although teaching building measurement is important, it can be dry and students have to grapple with a lot of detail.

While learning the subject matter relies heavily on hands-on exercises and tutorials, students also need to possess the underpinning technical knowledge in order to benefit from the practical work.

The subject is challenging for many of our postgraduate students, who are mostly from China.

Postgraduate classes are run in three day intensive blocks and the compressed delivery added to problems associated with English proficiency make the subject particularly difficult for some.

In view of these challenges it was decided that a flipped classroom approach may offer greater benefit to students, with the basic knowledge being delivered online and more class time being devoted to tutorial work rather than to lectures.

Apart from allowing more class time for practising measurement with tutor assistance, making subject content available online can increase opportunities for students to revisit lecture material where and when they choose.

This is likely to be particularly valuable for students from non-English speaking backgrounds.

Microlearning

The flipped approach was also inspired by a paper entitled 'Bite Size is the Right Size: How microlearning shrinks the skills gap in higher education'.

This paper, produced by the Grovo company in the US, suggests that the best learning occurs when content is delivered in 'bite-sized chunks' that combine visual and audio content.

The paper includes a pertinent quote from Confucius: "What I hear, I forget. What I see, I may remember. What I do, I understand." This seems particularly apt in the context of teaching building measurement.

The basic idea was to produce short narrated and animated video clips that each explained just one or perhaps two (related) concepts which students could watch/listen to on a laptop, tablet or smart phone away from class.

These clips could be viewed as many times as necessary so that students would be able to fully understand the content before attempting related tutorial work in class.

The Process

Initially five clips were produced, each dealing with a single topic. The average length of the clips is around eight minutes.

Rick produced a roughly animated PowerPoint presentation for each topic with roughly sketched diagrams and a voice over recording using Camtasia software.

These raw presentations were then transformed by Bond architecture student Richard Jedryas and Bond animation graduate Joseph Wood, using Videoscribe software to provide more engaging animation than was possible in PowerPoint.

Richard also produced polished illustrations to replace the rough diagrams. Piano blues tracks were recorded and added to the beginning and end of each clip to provide a little extra interest.

The initial set of clips was intended as a proof of concept, with a view to expand the project and produce a large suite of clips covering most of the basic concepts covered in Measurement 1.

Reception

The clips have been shown to a variety of people and have been well received. For example:

'I have looked at the three videos, and I think they are very good. It is possible that even I could pass a test on these concepts' – Prof Emeritus Ron Best, former Dean of Education at Roehampton University (UK)

'I've just watched several of the videos on ilearn..... Honestly speaking, this kind of way is really useful and help a lot, I think especially for those students whose first language is not English. I really like it! I will keep tracking the videos with the progress of the lectures. It surely can help me a lot to strength the understanding and knowledge of this course. Greatly appreciated!' – international student in Measurement 1 (postgraduate).

Judy Doherty, who teaches the subject, presented a couple of the animated clips at the 2015 Learning and Teaching Week: 'Spotlight on the Faculty of Society and Design' session and they were well received by the audience.

Future Plans

The original intention was to add an animated character, Bill Le Mesurier, to the clip collection. An early version of Bill was created, but unfortunately did not make it into a finished clip.

Currently Judy Doherty is providing illustrations and Rick Best is responsible for PowerPoint/Camtasia work. The resulting PowerPoint narrated clips are useful but do lack the visual impact of the Videoscribe clips and Richard's creative input.

OLT has been supportive of this project, but more resources will be required to expand this project beyond PowerPoint clips with narration.

Judy and Rick strongly believe that this approach, particularly with more engaging visual interest, will produce better learning outcomes for students in the traditionally problematic subject area of building measurement.

Even students who do get the general idea reasonably quickly and painlessly often miss many of the finer details.

By creating and making more of these clips available to students, even the relatively static PowerPoint versions, there should be an overall improvement in student learning. These improvements will hopefully be reflected in student results and this will also increase teacher satisfaction.

Advice to Colleagues

Even creating PowerPoint Camtasia video clips takes time but the investment is worthwhile. In the case of Measurement 1 the subject matter is quite static so once a clip is completed it can be re-used semester after semester.

Use of this approach is not advised in the case of a more fluid subject, where content needs to be revised regularly. Having said that, most subjects could address fundamental concepts in a similar way. Rick encourages other lecturers to consider moving at least a small part of their content delivery to the so-called 'microlearning' space. ■

References

Grovo (2014) Bite Size Is the Right Size [online] Available at: <http://a1.grovo.com/asset/whitepapers/Grovo-BiteSize-Microlearning-whitepaper.pdf>

Rick is Associate Professor of Construction Management and Economics for the Faculty of Society & Design. Following a number of years in architectural and quantity surveying practices Rick moved to lecturing in quantity surveying and construction.

Rick's research interests include construction education, international construction costs and environmentally sensitive building design.

He has edited and contributed to a number of internationally published books and chairs two national committees dealing with construction education and accreditation.

Rick also chairs the management committee of the Australasian Journal of Construction Economics and Building and is on the editorial board of several international refereed journals.

ANALYSIS



unit rate for concrete in columns of \$300/m³

- ☆ 0.68m³ x 200 x \$300 = \$40,800
- ☆ 0.70m³ x 200 x \$300 = \$42,000

THE DIFFERENCE IS VERY SMALL