Assessment for Learning (Book, Chapter, Jigsaw)

Overview

Summary

A flipped classroom approach using a jigsaw book exercise with undergraduate civil engineering students (n=474) in years 1,3,4,5. -To focus the learning and assessment process on students being active in constructing their (own and group) knowledge (explicit and tacit) and to promote a ‘reflective practitioner’ behaviour akin to that of professional engineers. -To introduce students to the role of civil engineering knowledge and practice and to establish a foundation on which students will be self-motivated to ‘read’ widely as a commitment to becoming a professional engineer. - To introduce students to a collaborative learning space where peer knowledge is considered to be contributory (as opposed to ‘in competition’) to a holistic understanding of new knowledge whereby cooperation can be seen to lead to synergistic outcomes.

Context

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Themes

interdisclinarity

staff_resources

faculty_engineering

Rationale

This coursework and classroom reading activity is an “Assessment for Learning” (Afl) exercise (Sambell et-al 2012. p.51) that seeks to encourage students to take ownership and make sense of their learning through ‘organizing it into meaningful concepts, exploring ideas, reflecting, making connections by trying to link new content and associating it with what they already know’. This Afl “exercise” (students are active learners!) employs a “flipped learning” (HEA 2015) approach that requires each student to read a book chapter (and to make appropriate notes) before attending a peer learning tutorial session. During the tutorial students participated in a modification of a learning technique known as “the jigsaw classroom” (Voyles 2015). The jigsaw classroom required students to work collaboratively (mutual dependence) in small groups so as to share the learning activity (reading of four book chapters) making them responsible for their peers learning (as a teacher) as well as their own. The output is intended to produce evidence of synergy whereby the combined new knowledge is greater that it would be had the students undertaken the reading as individuals. Fairbairn and Fairbairn (2001, p.162) offer sensible advice to students in regards to how they should approach such a reading exercise:

> ‘Each member of your group should view himself as an explorer visiting an unfamiliar place- making detailed notes of the intellectual landscape, which he then shares with his co-explorers. It is as if each person draws a sketch map and offers a verbal guide to the main landmarks and significant features of the landscape of the text they have explored, thus facilitating the others in carrying out their own, more detailed exploration’.

References

Fairbairn G J and Fairbairn S A (2001) *Reading at University: A Guide for Students*, Maidenhead: Open University Press.

Higher Education Academy (2015) Flipped Learning, https://www.heacademy.ac.uk/enhancement/starter-tools/flipped-learning-0.

Sambell, K., McDowell, L. and Montgomery, C (2012) *Assessment for Learning in Higher Education*. Abingdon: Routledge.

Voyles, E.C, Bailey, S.F and Durik, A.M (2015) New Pieces of the Jigsaw Classroom: Increasing Accountability to Reduce Social Loafing in Student Group Projects, *The New School Psychology Bulletin*, 13(1):11-20.

Successes

- 355 students (75%) agreed strongly-agreed that their book chapter was of interest and informative in regards to new knowledge about civil engineering practice.
- 293 students (62%) agreed / strongly-agreed that they gained new learning from their peers.
- 392 students (83%) agreed / strongly-agreed that the jigsaw activity had increased their self-confidence communicating ideas to others.
- In assessing their peers' confidence, 355 students (75%) agreed strongly-agreed that their peers demonstrated confidence in communicating new knowledge.
- 343 students (72%) agreed / strongly-agreed that the jigsaw exercise should be used again next year.
- 231 students (49%) agreed / strongly –agreed that the jigsaw technique should be recommended to other tutors within their course of study.

*I would highly recommend that this project is used again next year as it was highly enjoyable and gave **a different approach to learning something new**.*

*Overall I thought the jigsaw exercise **was a different and innovative method of learning and one that I hadn’t experienced before.***

*Overall, I thought the Jigsaw approach to learning was **satisfactory and a unique way in learning something new.***

***The Jigsaw Book project is something I’ve not really done before**. I’ve worked in groups before, but not as part of a team reading different chapters of a book and reporting about it, that part was new.*

*Overall from participating in the Jigsaw Coursework, **I definitely feel I have gained new knowledge through previously unused methods.** I liked the idea of sharing information through discussion and flipped learning and felt it encourages more participation from everyone involved*.

Please see the attached document (CEE Combined Book Jigsaw Results 2016-18 Session) for a more comprehensive set of results.

Challenges

Time taken to evaluate the initiative, particularly in regards to the thematic analysis of reflective reports if these are part of the student submission.

Lessons Learnt

Collaborative learning can help students improve their self-confidence, particularly in relation to expressing their ideas to peers and improving their listening skills. It can also be fun!

Reliance on peers can induce positive and negative outcomes. Some students believed that they could not trust their peers to ‘learn for them’ whilst others were glad to receive assistance.

Formation of the expert groups resulted in a significant number of students meeting each other for the first time, even within the 4- 5th year modules! Making new friends was considered a positive outcome of the jigsaw exercise. More senior year students suggested this would be good practice for students in transition to university. Establishing friendships is known to help students develop dispositions to stay on at university and succeed.

During the expert group activity there is a need to encourage discussion within each group as most students assume the role of ‘teaching’ each other too literally. Discussions amongst students appeared to be prevalent where the new knowledge related to prior learning, particularly summer placement experience.

Scalability

This cases study was undertaken with four cohorts. The 5th year elective class had sixteen students and was relatively easy to coordinate. The problem with larger classes (1st year n= 97) was the noise transfer within the room during the jigsaw activity. This has a negative impact on promoting discussion amongst peers.

As with all pedagogical initiatives that involve group work, securing a room where students can form into a group (face to face) may require a change of room for the day that the jigsaw session will take place. Request a room with tables and chairs in advance. A lecture theatre environment is difficult to modify into a collaborative group environment.

Suggestions for Transferability

The jigsaw approach (and employment of a book reading) is transferable to any discipline across the university.

Attachments

File	Modified
JPEG File header image.jpg	Apr 24, 2017 by Robina Nicholson
PDF File CEE Book Jigsaw Results 2016-18 .pdf	Aug 06, 2018 by Alex Buckley

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