Perceptions of a ‘flipped classroom’ approach to teaching and learning: a case study

Dr Helen Boulton, National Teaching Fellow

Nottingham Trent University, Nottingham, United Kingdom

Helen.boulton@ntu.ac.uk

Twitter: DrHelenBoulton

Overview

- Background.
- Previous research – literature review (brief).
- Environment.
- Student-Centred Activities for Large Enrolment Undergraduate Programs (SCALE-UP).
- Conclusion.

Background

- Nottingham Trent University, UK,
- School of Education - BA(Hons) Childhood Studies, BA(Hons) Secondary Design and Technology Education and Post-Graduate Primary Education.
- SCALE-UP - Student-centred active learning environment with upside-down pedagogies. Larger cohorts can be taught together.
- Pedagogical model – flipped learning.

Nottingham Trent University

Background and context to research

- My background.
- Professional Doctorate.
- Working with Hong Kong College of Technology (HKCT).

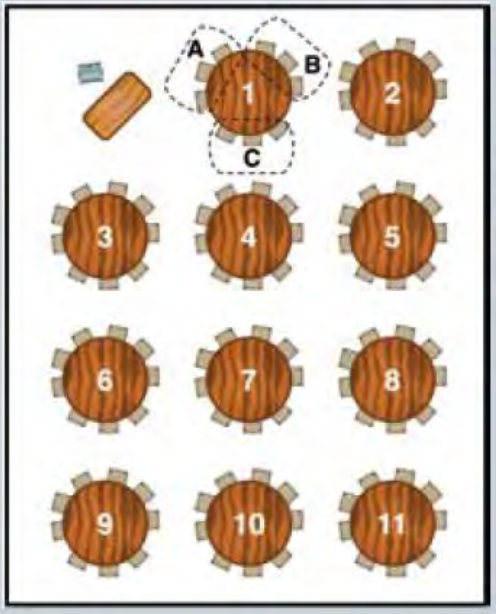
c)

d)

- Tables to support interactions between and within three teams of three students each
- Each team shares a laptop
- Sutdents work on a wide variety of activities during class

Beichner et al., 2007

FIGURE 2



A possible SCALE-UP layout for a 40′ × 50′ room. The tables have a 7-foot diameter. The instructor station can go anywhere in the room; its location depends on doorways and teachers' preferences. Such a room can hold 99 students. Three groups of three students are at each table. There are three laptops at each table, and whiteboards surround the room.

The tables are the most important technological presence in the classroom

Gaffney et al., 2008

MIT

Process of flipped learning at NTU

- Flipped classroom pedagogical approach classes were set preparation materials addressing theoretical concepts to engage with prior to the in-class sessions which would take place in the Scale-Up room. Students were then put into groups and set group activities to apply the theory from the preparation stage to practice through problem-solving activities.
- 1 group per circular table.

Implications on resources

- 5 year regeneration project at Clifton Campus.
- Refurbishment of room.
- MacBooks – staff training, inc technical support in sessions + student training.
- Apple TV.
- Pedagogy – modules driven by learning outcomes, Benchmark statements and approved at validation events and inspected by QAA.
- Assessment – formative and summative.

Research

- Part of Commissioned Enquiry undergraduate module.
- Purpose - to identify whether this approach to learning, resulting in new pedagogy, is a positive experience for students and staff.
- Methodology primarily questionnaires, observations and interviews.
- This paper provides new knowledge relating to introducing flipped learning into Higher Education.
- Builds on Beichner's model main goal in developing this model was to establish a highly collaborative, hands-on, computer-rich, interactive learning environment for large cohorts where students had the opportunity to 'interact with faculty, collaborate with peers on interesting tasks, and are actively engaged with the material they are learning' (2007, p3).

Previous research - literature

- Bishop and Verleger (2013, p1) describe flipped learning as 'The flipped classroom is a **new pedagogical method**, which employs **asynchronous video lectures and practice problems as homework**, and **active, group-based problem solving activities in the classroom**'.
- Beichner and Saul (2013) identify key outcomes of the SCALE-UP pedagogy as resulting in **increased ability to solve problems**, **increased conceptual understanding, increased attendance and satisfaction, reduced failure rates and increased success for 'at risk' students in subsequent modules**.
- Berrett (2012) extends student preparation from video lecture to pre-session reading or podcasts – **extends learning beyond classroom**.
- Mazur (2012) found that students' brains are more asleep during lectures than when they are in bed suggesting that **activity based problem-solving** where students apply theory to practice, results in **deeper learning and increased progression**.
- Fulton (2012, p.2) '**significant increases in student learning** and achievement when flipping compared to baseline data on the same courses taught in the traditional classroom lecture mode, using the same assessments'.
- Herreid and Schiller (2013) **thinking being promo**ted **inside as well as outside** of classes thus **engaging students more actively in their learning**.

Methodology

- Respondents = 90 students (18-45); 3 staff.
- interpretive approach was taken for this study (Bogdan & Biklen, 1998).
- Data was collected by the student researchers via questionnaires (Thirty-one questionnaires were distributed to first year students, forty two questionnaires to second year students, seventeen questionnaires to post-graduate students)
- Interviews with students and tutors, providing opportunity for triangulation thus giving validity to the findings. Observations of SCALE-UP sessions provided additional data. Key areas of focus for the data collection had been identified from the literature review such as preparation by students.
- Ethics – BERA guidelines; ethical clearance from NTU.

Findings

- Collaborative learning.
- Intensive in teacher preparation.
- More intensive for students prior to seminars.
- More engaging.
- Increased student centred learning – students increased freedom and control (Lancaster, 2013; Rutherfoord and Rutherfoord, 2013).
- Students work at own pace – individual learning strategies (Berrett, 2012).
- Students are more engaged, show greater enthusiasm, enjoyment and improved attendance. Some evidence of improved results.
- Deeper level of understanding (Miller 2012).
- Inc confidence (Gaffney, 2008).
- Inc employability skills eg team-building and problem solving.
- Will be wider involvement across University next year.
- Richer learning environment.

Conclusion

- The findings indicate that although respondents (n=90) benefited from this approach and new pedagogy, particularly the collaborative learning environment and more individual experience of leaning.
- Ability to solve problems and apply theory to practice is improved.
- Conceptual understanding is increased.
- Attendance and satisfaction is improved.
- Students report higher level of intellectual challenge.
- There are emerging challenges such as resourcing, support for tutors and transitioning students.

SCALE-UP video

www.youtube.com/watch?v=MdymI61hLPY&list=PLE8C54256779B374D&index=3&feature=plpp_video *Or via the SCALE-UP site: scaleup.ncsu.edu/*

Selected papers

- Beichner, R. 2008. *The SCALE-UP Project: A Student-Centered, Active Learning Environment for Undergraduate Programs.* National Academy of Sciences white paper. www7.nationalacademies.org/bose/Beichner_CommissionedPaper.pdf
- Beichner, R.J. and Saul, J.M. [no date] Introduction to the SCALE-UP (Student-Centered Activities for Large Enrollment Undergraduate Programs) Project. Project Kaleidoscope (PKAL). www.pkal.org/documents/IntroToSCALEUP.cfm
- Other papers and an overview: *www.ncsu.edu/per/scaleup.html*

Room design

- Photos and diagrams of SCALE-UP rooms:
  scaleup.ncsu.edu/wiki/pages/12m1C9c6/Massachusetts_Institute_of_Technology.html
  scaleup.ncsu.edu/FAQs.html
- Notes on the room design (paraphrased from PKAL SCALE-UP instructions): http://serc.carleton.edu/sp/pkal/scaleup/how_implement_scale-up.html)

  Round tables (some institutions use X-, T-, or bean-shaped tables)
  Comfortable chairs
  3 teams of 3 students share a table
  White boards near each table (large, wall-mounted, or small, portable)
  1 laptop per team
  Original rooms at NC State have 11 tables of 9 students (many smaller rooms at other institutions, some larger)

Adoption

https://maps.google.com/maps/ms?ie=UTF8&hl=en&t=h&msa=0&msid=116197744044172474831.00044c0413eb2c6118d0e&ll=36.879621,-97.734375&spn=34.899167,70.3125&z=3&source=embed