Higher Education Psychology Teacher of the Year Award finalist paper

Facilitating group work in large cohorts with collaborative technologies

Elizabeth Orme, Natasha Rossiter, Melanie Rowe & Lisa Thomas

Summary
- A tutorial-based flipped classroom approach was implemented to support small group teaching in very large cohorts (350+).
- The key aim was to provide individualised support for students in research methods, whilst promoting flexibility and inclusivity through a blended delivery model.
- Benefits included improved student experience and performance, as well as improvements in the experience of group work.
- We also demonstrate how Microsoft Teams can be used to provide an effective blended learning environment for group work.

Keywords: student-centred, collaborative learning, project-based learning, group work, large group teaching, online.

Reasons for introducing this teaching method

As an empirical discipline, psychology courses have a strong focus on research methods. However, it is well documented that psychology students often lack confidence in relation to research methods (e.g. Dempster & McCorry, 2009). In order to support students' learning and motivation in research methods, modules often employ a research-based approach (Healey, 2005), using problem-based learning to engage students in designing and conducting their own research projects with the staff acting as facilitators to support students identifying a suitable solution (Narmaditya, Winarning & Wulandari, 2017).

Existing Method: In our own modules, students typically attend one class per week for two hours (around 80–100 students in each class) and work in small groups (4–6) on predefined research projects with a member of academic staff and a number of PhD students facilitating the class. The use of group work allows students to collaborate, share ideas and participate more actively in their learning (Fraser & Deane, 1997). Whilst this groupwork approach is well established, and has many benefits, it also presents several issues, reflected in our own student feedback and in the literature (e.g. Narmaditya et al., 2017). Specifically:
1. Unequal contribution of effort amongst group members and individual efforts not reflected in the final mark.
2. Logistics of group work (e.g. arranging meeting times, agreeing group deadlines).
3. Lack of support from academic staff in negotiating group work issues.

In addition, we have very large cohorts (350+) which makes addressing students' concerns with groupwork a significant challenge and one of the most common

Table 1: Key features of the new method of teaching practical research skills

Key Feature	Description
Flipped Classroom	• Students are given a recorded briefing at the beginning of each 6-week block • Instructed to design a research study within a set of constraints • No new content delivered within the module - student draw on the theory and methods they have learnt in other modules
Group Tutorials	• Students have a weekly one-hour tutorial with a lab tutor • Students present their work so far and agree a set of actions for each group member • Lab tutor acts as a facilitator, focus is on the students to drive their projects forward
The use of physical and virtual learning environments	• I supervise our main experimental lab space from 9am – 5pm on the day of the tutorials • Groups have the flexibility to join the lab with us for as long as they wish, or to work elsewhere on or off campus and receive remote support • Group work is built around the use of Microsoft Teams - using a blended delivery model of virtual and in-class support • Students can work off campus, and tag the module tutor or their lab tutor to ask questions, have us review documents etc. in real-time • Allows collaboration in a flexible and inclusive manner
Support from PhD Students	• A module typically consists of up to 100 separate groups, and so to support this we employ PhD students as lab tutors • I run an intensive training day in the summer, with associated activities around standardisation of marking. The training specifically focuses on how to manage difficult group work situations, and more broadly how to support student learning. • Weekly briefing meeting with the lab tutors • PhD students use the module as the basis for gaining Associate Fellowship of the HEA
Assessment and Feedback	• Each block has two assessments. A group project proposal (worth 10% of the assessment mark) and then an individual lab report (worth 90% of the assessment). These are marked by their lab tutor and students are given written and individual face-to-face feedback.

issues with student satisfaction on our programmes.

New Method: In 2019 we redesigned our approach to small group work for research methods across the psychology curriculum focusing on the use of flipped classroom (Akçayır & Akçayır, 2018) and tutorials (Exley & Dennick, 2004). There are several key features to the new approach, summarised in Table 1.

Benefits
Students' engagement in and out of class is monitored and rated on a 4-point scale by

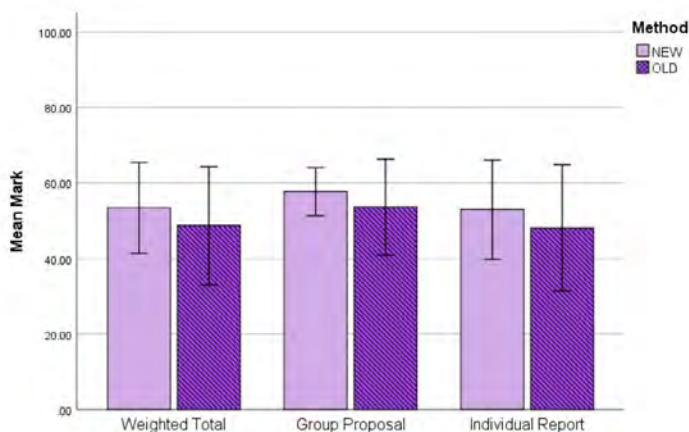**Figure 1: Mean module marks for the two teaching methods, Error Bars = +/- 1 SD**

Table 2: Measures used in the evaluation of the new method

Measures	Brief Description
Outcome Variables	
Perceived Skill Development Scale (Alavi, 1994)	Measures students' perceptions of their academic skill development, with items such as *'I increased my skills in critical thinking'*
Self-Reported Learning Scale (Alavi, 1994)	Measures students' perceptions of learning of module content, with items such as *'I increased in understanding of basic concepts'*
Performance	Students final module mark
Engagement	Tutor ratings of students' engagement in and out of class
Predictors	
Solution Satisfaction (Green and Taber, 1980)	Measures satisfaction with the group's outputs, measured with items such as *'I feel committed to my groups work'*
Process Satisfaction (Green and Taber, 1980)	Measures satisfaction with the process of group work, with items such as *'My groups problem-solving process was fair'*
Positive and Negative Social Space Scales (Kreijns, Kirschner, Jochems, & van Buuren, 2007)	Measures students' perceptions of the social space (both in class and virtually), with items such as *'The group conducted open and lively conversations and/or discussions* [positive]' and *'Group members gossiped about each other* [negative]'
System Sociability (Kreijns et al, 2007)	Measured perceptions of the virtual learning environment (MS Teams) as a group work tool, with items such as *'This system enabled us to develop into a well performing team'*

their tutor (1 = very little engagement, 4 = highly engaged). Engagement ratings have increased, Mean Engagement in the old method was 2.36 (SD=1.00; N=231) and the new method was 2.81 (SD=0.84' N=341; t_{570} = 5.78, p < .001). As can be seen from Figure 1, we also saw increased marks for the overall weighted average (t_{570} = 4.08, p< .001), the group marks (t_{570} = 5.00, p<.001) and the individual report marks (t_{570}=3.84, p<.001).

In order to evaluate the introduction of our new approach and MS Teams as a teaching tool, we launched a survey. Previous research has indicated that students who perceive learning technologies to be more sociable and collaborative have better outcomes in terms of their own perceived learning, and objective measures of performance (i.e. grades; Koh & Lim, 2012) and so we included a number of measures (summarised in Table 2). 160 students completed the questionnaires; and of these 122 consented to us linking their questionnaire responses with their module performance.

Regression analyses revealed some key predictors of engagement and performance. The model significantly predicted ***perceived skill development*** (R^2 = .369, $F_{5,156}$=18.26, p<.001). Here solution Satisfaction (β = .391, t_{156} = 4.06, p <.001) and System Sociability (β = .300, t_{156} = 3.44, p = .001) were both significant predictors. The same pattern was observed ***for Self-Reported learning*** (R^2 = .271, $F_{5,156}$=11.59, p<.001; Solution Satisfaction β = .349, t_{156} = 3.38, p = .001; Sociability β = .246, t_{156} = 2.62, p = .010). The model was also able to account for 16.1% of the variance in actual performance on the module (R^2 = .161, $F_{5,96}$=3.66, p=.004), here solution satisfaction was a significant predictor (β = .351, t_{96} = 2.37, p = .020) and positive Social Space was marginally signifcant (β = .358, t_{96} = 1.73, p = .088)

Overall this pattern suggests (i) satisfaction with the outputs of the group is a significant predictor of both subjective and objective indices of learning; (ii) the sociability of the systems used to support learning are important for enhancing subjective experiences of learning, (iii) the positive social environment is tentatively linked to module performance.

Issues
The introduction of the approach has been overwhelmingly positive, for both students and staff. We hadn't anticipated students using the general lab space as heavily (some would come at 9am and stay all day to work with their group), and so we had to book a second lab and support this. There were also logistical issues with setting up 100+ MS Teams groups, we are hoping for the introduction of private channels on Teams which will allow us to manage the group work within a single team. The Covid-19 pandemic also meant that on campus support had to be withdrawn from one module (not the one evaluated here), and comparative data is only available for one module that was unaffected by this. However, our existing use of MS Teams made this transition easy to navigate.

Student's perspective
The new structure has been well received and students enjoyed the module, this is reflected in the module evaluation data (See Table 3.). The qualitative comments reflect this, e.g. *'the lab classes are well structured. It's nice to have tutorials with the lab tutor at the beginning, it's really informative. The use of teams is excellent, a lot better than using the blackboard system. It's good to have the tutors available to help in the larger lab'.*

Reflections
This module was the most positive teaching experience I have had in the 13 years I have been teaching research methods. We initially

Table 3: Module evaluation results for the new and old methods of teaching the module

Question Area		Overall satisfaction	Module organisation	Intellectual Challenge	Staff Support	Assessment and Feedback
% Students Agree or Strongly Agree	Old Method	67%	64%	71%	55%	64%
	New Method	76%	88%	91%	86%	75%

struggled with the idea of flipped classroom, not providing a 'lecture' at the start of the class, and having students come and go as they wish, was a big change. We were also sceptical about student engagement. They could have chosen not to prepare, or not take up the support on campus. Previous research (e.g. Akçayır & Akçayır, 2018) has highlighted that a lack of preparation on the students' part is often a barrier to flipped classroom. However, the biggest issue we encountered was capacity of the lab, as students were staying for much longer than the two hours we used to timetable for these activities! Whilst we've highlighted the changes in student performance on the module above, the biggest improvement was a qualitative change in students' work. We saw much more creative ideas and challenging projects, and we were particularly pleased to see that the increase in report marks within the module was far greater in the new method, suggesting learning within the module was very much linked to the new approach.

Dissemination and publication

As the project only concluded in July this year, the findings are still being prepared for publication. We have disseminated the findings through the university CPD programme. As many staff have switched to the use of Microsoft Teams due to the Covid-19 pandemic, we were able to provide guidance and support for staff across the university in managing this process. We recently published a paper around supporting student transitions with technology (Thomas, Orme & Kerrigan 2020) and presented these findings at the Three Rivers learning and teaching conference, where we discussed how MS Teams can be used to facilitate community in large cohorts (Thomas, Orme & Kerrigan, 2019).

Authors

Elizabeth Orme, Natasha Rossiter, Melanie Rowe & Lisa Thomas, Department of Psychology, Northumbria University

Correspondence

Elizabeth Orme
Elizabeth.orme@northumbria.ac.uk

References

Akçayır, G. & Akçayır, M. (2018). The flipped classroom: A review of its advantages and challenges. *Computers & Education, 126,* 334–345.

Alavi, M. (1994). Computer-mediated collaborative learning: An empirical evaluation. *MIS quarterly,* 159–174.

Dempster, M. & McCorry, N.K. (2009). The role of previous experience and attitudes toward statistics in statistics assessment outcomes among undergraduate psychology students. *Journal of Statistics Education, 17*(2), 1–7.

Exley, K. & Dennick, R. (2004). *Small group teaching: Tutorials, seminars and beyond.* London and New York: RoutledgeFalmer.

Fraser, S. & Deane, E. (1997) Why open learning? *Australian Universities Review, 40*(1)*,* 25–31.

Green, S. & Taber, T. (1980). The effects of three social decision schemes on decision group process. *Organizational Behavior and Human Performance, 25*(1), 97–106.

Healey, M. (2005). Linking research and teaching to benefit student learning. *Journal of Geography in Higher Education, 29*(2), 183–201.

Koh, E. & Lim, J. (2012). Using online collaboration applications for group assignments: The interplay between design and human characteristics. *Computers & Education, 59*(2), 481–496.

Kreijns, K., Kirschner, P., Jochems, W. & van Buuren, H. (2007). Measuring perceived sociability of computer-supported collaborative learning environments. *Computers & Education, 49*(2), 176–192

Narmaditya, B.S., Winarning, W. & Wulandari, D. (2017). Impact of problem-based learning on student achievement in economics course. *Classroom Action Research Journal* (CARJO), *1*(1), 1–11.

Thomas, L., Orme, E. & Kerrigan, F. (2020). Student loneliness: The role of social media through life transitions. *Computers & Education, 146,* 103754.

Thomas, L., Orme, E. & Kerrigan, F. (2019). Student Loneliness: The Role of Social Media Through Life Transitions. Paper Presented at the 3 Rivers 2019 Learning and Teaching Conference. Durham University, UK