Efficacy of Peer Support for Second-Year Mathematicians

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Efficacy of Peer Support for Second-Year Mathematicians - outline

- Background to the SYMBoL project / Why ?
- How we set it up
- *On the receiving end of peer support* – the views of a second year mathematics undergraduate
- *Offering peer support* – the views of a third year Student Leader
- Achievement data

Efficacy of Peer Support for Second-Year Mathematicians – background / why ?

- *"the priority given to first year students [in the MLSC] was unfair on those in other years <u>who often couldn't get any help</u>."*

- *"surely the help centre should be for all maths students who need help"*

- *The fact remains I did leave with a 2.1 in maths and in this respect the university experience was technically a success. However, looking back, I still feel annoyed <u>that the experience could have been so much better.</u>"*

- *"It was nice last year to work in here and be able to ask for help when needed; we now have to see our lecturers each time – it is hard to arrange appointments and you can't ask to sit in their office for two hours working through problem sheets"*

Efficacy of Peer Support for Second-Year Mathematicians – background / why ?

- *"For many of those staying [on the course]… the problems of coping with the work were accompanied by growing disillusionment with mathematics; generally (with some exceptions) students' enjoyment of the subject declined over time"*

  Brown et al (2002/2005) SEUM Project.

- Daskalogianni and Simpson (2002), studied undergraduates in a [different] prestigious UK mathematics department; refer to a 'cooling off' phenomenon as students lost interest, and became increasingly withdrawn in a vicious circle of disillusionment.

- Goulding, Hatch and Rodd's (2003) survey of trainee teachers' experiences of undergraduate mathematics in 65 universities found evidence of struggle and reported lack of support. *"I hated it most of time… It became difficult to enjoy some of the maths modules if you were struggling and couldn't get any help"* (p. 373).

The SYMBoL Project

Enhancing the second year experience for undergraduate mathematicians

- Opportunities for students to work directly with staff (as interns) to reshape and contribute to the development of two second year modules [*Vector Spaces* and *Complex Variables*]

- Establishment of a peer-assisted learning scheme with Part C & Part D students supporting second years

The SYMBoL Project

Recruiting and training the student leaders

- 2011/12: We recruited 13 successful second-year students to work as student leaders
- We provided extensive training and support

Receiving Peer Support:
A Student's Perspective

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Recap: Information about the PAL Sessions

One module per semester: 'Vector Spaces' in Semester 1, 'Complex Variables' in Semester 2.

At least 10 PAL sessions per module: one session per week (50 mins – 1hr each).

Maximum of 20-25 students per PAL session; 2 or 3 PAL leaders per session.

What were the sessions like?

- Plenty of maths involved – from the first week onwards!

- Informal, friendly atmosphere

- Very different from the usual lectures and problems classes I had experienced so far

Why do I think the PAL sessions were 'different'?

Experienced Difference	Reason for Difference
Active involvement	Renegotiation of 'didactic contract'
Approachable leaders	Leaders are similar in age and ability to students; more informal setting
Friendly, supportive environment	Specific classroom culture encouraged by leaders 'Removal' of social stigma which students may feel is present in traditional settings
Adaptability of sessions	Encouragement of student input; focus on what would be most beneficial all the time

After the PAL sessions...

- End of module examinations in 'Vector Spaces' and 'Complex Variables' (90% of overall module grade)

- Good achievement in both modules - a result of PAL?

- I had really enjoyed 'the PAL experience'

- Call for interested second year students to become PAL leaders themselves – I signed up!

Providing Peer Support:
A PAL Leader's Perspective

My first PAL session – what was it like?

- Nervewracking! My first experience of being 'in front of a class'
- High turnout – 90% of possible students
- Not all of it went as we thought it would!
- New experience for the students, too – not all of them 'got it' at first...

Why didn't students 'get it' at first?

Observed Behaviour	Possible Justification
Confusion about the need to contribute in sessions and be actively involved in learning	Took time to accept new 'didactic contract'; lack of exposure to this style of learning before?
Initial reluctance to work with other people in the group	Unfamiliarity with some members of the group
Hesitance to feed back to PAL leaders about progress, ideas and solutions to tasks	Lack of familiarity with the leaders; uncertain about the role of student input in PAL; possible fear of making mistakes in front of the group
Reluctance to critique other students' suggestions and ideas during discussion	Uncertain about classroom culture, uncertain as to how comments would be treated (social stigma)?

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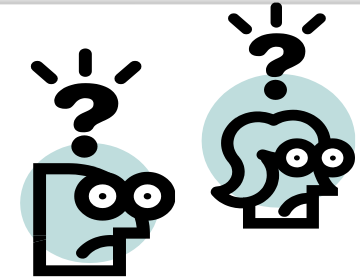
How did we overcome these obstacles in PAL?

- We explicitly mentioned the need to be actively involved with learning in PAL

- We were always friendly and approachable, no matter what the question was!

- We took time to get to know the students better

- We made it clear that all ideas and input to the sessions were valued, and established a supportive classroom culture

- We facilitated discussions and created tasks where interaction with others was required

- We got students involved with setting and solving questions (using volunteers if possible!)

After a few more weeks of PAL sessions...

Students are really engaging with the methods used in PAL.
They begin to be far more actively involved in their learning!

Final Thoughts on PAL – from the students!

- "Our PAL sessions are the best!"

- "I don't know what I would have done without PAL sessions..."

- "I'm pretty sure I would have failed that module if it weren't for PAL..."

Measuring the Success of PAL: Achievements and Analysis

Attendance

There were 83 students registered for the *Vector Spaces* module (2011/12). 57 of these have accessed peer support sessions at least once.

	1	2	3	4	5	7	8	9	10
No attending	45	43	46	39	42	15	23	31	31

Some achievement outcomes

Vector Spaces

- A significant correlation between module mark and attendance at the PAL sessions (r=.482, p<.001).

- This result retained significance even after prior attainment (a mark on a related first year module) and lecture attendance were controlled

- (pr=.258, p=.026).

- In other words, if two students with similar prior attainment and similar lecture attendance had attended different numbers of PAL sessions, it is probable that the student attending more PAL sessions would have obtained a higher examination mark.

- [data collection and analysis courtesy of Matthew Inglis & Francis Duah]

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Summary

- We established a peer support scheme to help address a long-standing problem
- We believe it was novel in that third (and now fourth) year students support second years
- Students voted with their feet with approximately 1/3 attending regularly
- There were statistically significant gains in module mark for those attending, even after controlling for prior attainment and attendance
- A huge skills development opportunity for Student Leaders

Thank you for listening