

The role of second year laboratory based group work in undergraduate project preparation

Authors: Skingsley, Merry and Orsmond
Staffordshire University, Faculty of Sciences



Rationale

- There is an increasing need for students in the biological sciences to have:
 - practical experience of developing experimental protocols
 - a conceptual understanding of ethics and risk assessment
- These concepts:
 - are a requirement of final year projects
 - are part of their development as a professional biologist.

Background

- The research presented here forms part of an evaluation of a constructivist approach in the delivery of a second year practical module
 - Engagement in investigative practical work is an authentic activity (MacKenzie & Ruxton, 2007)
 - Student-directed learning can be seen as a preparation for professional practice (Wood, 2004)
 - A more investigative framework can help overcome some students' adverse perceptions of practical work (Collis *et al.*, 2007)

Methodology

- Setting
 - Post 1992 University.
- Participants
 - Second year undergraduates in Biomedical Sciences
- Instruments
 - Semi-structured interviews with 40% of the group cohort (12 students)
 - Questionnaire used with the whole group (to check the generalisation of the interview comments)
- Procedure
 - 2 weeks period prior to delivery (Interview and questionnaire)
 - 12 weeks of module delivery
 - 2 weeks post delivery (Interview and questionnaire)
- Analysis
 - Pre and post delivery thematic analysis of interview transcripts
 - Pre and post delivery modal evaluation of Likert scale questionnaires.

Course structure

Week	Practical Activities	Assessment Milestones	Milestone Tutorials
1	Weekly tutor lead practicals linking physiology and biochemistry which are illustrative of potential assessment activities		
2			
3			
4			Materials and Methods
5		Materials and Methods	
6			
7		Ethics	
8			
9		Risk Assessment (PRA)	Materials requisition
10		Materials requisition (PRF)	Troubleshooting
11			
12			

Results

- The key findings of the questionnaires and interviews was that participants felt that at the end of the module they:
 - discussed experimental design principles differently, being much more aware of the planning process needed for building ethics and risk assessment into the experimental design.
 - saw the role of the tutor more as providing guidance on their work rather than as a deliverer of information
 - still felt that the final year project was daunting but were more confident in their ability to independently undertake laboratory based tasks.
 - felt that the group work allowed ‘safe’ examination of experimental design in a new and interesting way.

Conclusions

- This study highlights how groupwork can enhance students' understanding of disparate concepts necessary for project development and professional development in the field of biology
- The construction of an environment where there is dialog particularly enables students to engage with the subtle and complex ideas underpinning the conduct of practical investigations
- Understanding the effect this approach has on students' development as scientists has been useful to us in the ongoing discussions linked to award and module improvement

Further studies

- Direct comparison of this approach to project preparation with that of a more didactic approach
- Evaluating the impact of technology supported learning as part of project preparation in an inclusive curriculum