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6 An activity-based approach to the learning and teaching of research methods: measuring student engagement and learning

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Abstract

The project had three separate, linked objectives: (a) the development of a module in Research Methods which embraces an activity-based approach to learning in a group environment; (b) to improve participation by all students and (c) to devise more rigorous and equitable assessment methods. This module was previously taught through a traditional lecture-based format. It was felt that student engagement was poor and learning was limited. It was believed that successful completion of the development of this module would equip students with a deeply learned battery of research skills to take into their further academic and professional careers. Student learning was achieved through completion of a series of tasks based on different research methods. In order to encourage student engagement, a wide variety of activities were used. Student engagement was measured through a survey based on National Survey of Student Engagement (2000). In terms of the three objectives set, two of these were met. The module was successfully developed and delivered and there was a significant level of student engagement in the module. The objective of devising equitable assessment methods was not satisfactorily addressed within the time available.

Key words: activity-based learning, research methods, engagement

Introduction

The project team members have been involved in supervising undergraduate and post-graduate theses/dissertations for a number of years, but have been unhappy with the quality of research skills evident in these. These skills had been acquired by students through a lecture-based Research Methods module. It was believed a number of features militated against deep learning of research methods. From a learning point of view the subject matter was perceived as boring and lacking context, attendance was poor, and there was little engagement with the material. From a teaching point of view, it was difficult to engage students and difficult to measure the extent to which the learning outcomes were achieved. Overall it was believed that activity-based learning was a more effective learning methodology than the traditional lecture format for the delivery of this module. The project was initially devised to address these issues.

In terms of the fit with Dublin Institute of Technology's Learning and Teaching strategy, the project focused on curriculum development. Specifically it aimed to devise a new method through which students learn, what is perceived by them, to be a very "dry" and unexciting set of skills, i.e. research methods. The module was designed to allow students to appreciate the value of research, the importance of undertaking it properly and the techniques necessary to achieve this.

It was believed that successful completion of the development of this module would equip students with a deeply learned battery of research skills to take into their further academic and professional careers. From an Institute point of view, the project team believed that this approach would have wide applicability and appeal across DIT.

The project had three separate, linked objectives:

1. to develop a module in research methods which embraces an activity-based approach to learning in a group environment;
2. to improve engagement by students;
3. and to devise more rigorous and equitable assessment methods.

Theoretical Framework

Following some desk-based research on innovative ways of teaching and learning and having tried some of the more accepted non-traditional practices like problem- and project-based, collaborative learning, some research was found on the benefits of activity-based learning.

Whilst elements of problem-, project- and collaborative-based learning are incorporated into activity-based learning, each are separate approaches in their own right. As explained in McGrath and MacEwan (2011: 263) and as is obvious from the name of the learning method in activity-based education the student becomes "more actively involved in the learning process through acts of 'doing', 'being' and 'critically reflecting' than in traditional, didactic education that is more centred around the passive act of 'knowing'". As noted in Johnson, Johnson and Smith (1998) (cited in Ahlfeldt, Mehta and Sellnow 2005: 5) "having the instructor provide all the materials to the passive student is the old paradigm. The new paradigm is to actively engage students with the material and one another". Activity-based learning therefore puts students directly in the experience of learning. As research

methods can be a dry subject to teach and learn in the absence of a context, it was agreed that this new approach would fit well with the nature of the content in a research methods and proposal writing course.

Once the learning and teaching approach had been decided upon, the next area of research was to find a way of establishing if, and how well, this new approach was working. As established in Hake (1998), the use of interactive strategies can increase course effectiveness.

It was decided that trying to establish how engaged students are during the activities would be an appropriate way of establishing whether students were responding to the activity-based approach. As noted in Ahlfeldt, Mehta and Sellnow (2005: 5) "engaging students in learning is one of the many goals that educators face". The USA has been leading the way in the measurement of student engagement. Through its student survey, the National Survey of Student Engagement annually collects information at hundreds of four-year colleges and universities about student participation in programmes and activities that institutions provide for their learning and personal development. The results provide an estimate of how undergraduates spend their time and what they gain from attending college. The primary purpose of the survey is "to query undergraduates directly about their educational experiences". (National Survey of Student Engagement 2011). The NSSE was designed to report on the frequency with which they engage in dozens of activities that represent good educational practice (Kuh 2009: 7). The survey used in this research was developed based on the NSSE (2000) and the survey developed in Ahlfeldt, Mehta and Sellnow (2005). Key areas of questioning revolved around the students' behaviour in the class activity, critical skills development and knowledge development.

Operation of the Module

The project had three distinct elements: designing activities/tasks, designing and undertaking an engagement survey and finally addressing the issue of assessing students in a group-based environment.

To encourage student participation, the module used a wide variety of activities, including workshops, brainstorming, mind-mapping, presentations, written submissions, peer critiquing, lecture/seminar, "speed dating" with more senior students, and self-reflection.

Students, working in small groups, were set a number of activity-based tasks and once each task was completed, feedback and formative assessment took place. The subject matter of the tasks focused on research methods and included tasks on quantitative versus qualitative research, criteria-based analysis, case study design, survey and questionnaire design and interview techniques. Student learning was achieved through completion of the tasks, critiquing the work of other students, receiving feedback from teaching staff and from other students, critiquing research proposals prepared by students in previous years, conception of a research topic, preparation of a draft research proposal and the derivation of an appropriate methodology through which to undertake the research.

Tasks were assessed through a range of outputs including hard copy submissions, presentations and self and peer critiques.

Findings

Engagement

Engagement was measured through a student questionnaire survey which was designed to get feedback on students' behaviour in the class activity, critical skills development and knowledge development. Key results of this survey were that students:

- felt that they had made a meaningful contribution to the group tasks
- considered that the approach adopted in the module created a positive learning environment
- found the approach and tasks set both interesting and challenging
- had fun during the module and regarded it as the learning highlight of their week.

Overall the results were very encouraging with between 63% and 96% of students answering positively to a range of questions concerning engagement.

In relation to specific survey questions

- 78% of students said that it was very characteristic or characteristic of them to contribute in class discussions
- 71% of students said that it was very characteristic or characteristic of them to ask a question of lecturers or class mates when they didn't understand something
- 63% of students said that it was very characteristic or characteristic of them to have fun during this module
- 96% of students said that it was very characteristic or characteristic of them to feel that lecturers created a positive environment for asking questions
- 70% of students said that it was very characteristic or characteristic of them to feel that they made a meaningful contribution to the tasks
- 70% of students said that it was very characteristic or characteristic of them to feel that they were challenged by the material and were interested in the material

In addition, feedback was sought on the operation of the module and on the specific tasks/activities and learning sessions. A selection is shown below.

Student feedback on module and activities

Overall operation of module

Overall this module was one of the highlights of my college week and a class I looked forward to.

I did learn a lot of useful information and techniques. I felt the time allotted was the right amount. It was a light and fun class which didn't not impact on other time consuming modules and it provided another opportunity to bond with other classmates.

I think overall that this module will help us greatly with our thesis next year. I hope that it will have taught us to think outside the box. I hope to use some of the research methods also in my future work.

I am very happy the PED course has brought in this type of module as it's very different to the other modules undertaken in third year, which makes things interesting, different as it is also a different type of teaching and extremely helpful in the long term.

I found the group work could be both helpful as you listened to other people's ideas and opinions and therefore gave a fuller view on a topic but it could also cause a hindrance as if people did not participate.

I felt that working in groups really helped me to get different perspectives on all aspects of the thesis. I thought that the group size was perfect and the time allocation with the groups was just right too.

I enjoyed the group interaction in the classes. They were a welcome change of scene from the usual two hour, sit and listen lectures that the rest of the course consists of.

Individual tasks

Interview activity

I felt this was an excellent task, we discussed how to conduct an interview and how to develop different types of questions. I had planned to undertake interviews (for my thesis) ... and this will help me develop my questions for the interviews.

Critiquing proposals

I found the proposal writing and peer critiquing very useful. It allowed me to share my thesis ideas and aims which helped me focus more on what I actually wanted to achieve in my thesis.

The constructive criticism enabled me to change aspects of my thesis idea that were too broad and enabled me to create a more focused idea with a clear aim.

Surveys and questionnaires

This was one of my favourite tasks of the module. It allowed us to take the idea which we were interested in and begin to understand the complexities of gathering data particularly through surveying. Before I had not realised the difference in question types and how to direct my questioning so as to acquire the information I need and now I feel I do.

Meet final years/speed-dating

The general consensus has to be the best aspect of the thesis was definitely that it was your own piece of work that you could be independent with and design yourself to a certain extent. They (the final years) said the autonomy was quite enjoyable.

Generating thesis idea

I think the less useful tasks were related to (generic) proposal generation. Although it was a good way of getting us to think about how to come up with a proposal I think it would have been more beneficial to focus it on areas people were actually considering.

Evaluation and Conclusions

In terms of the three objectives set, the project team believes that there have been varying degrees of success.

- *The development of a module in Research Methods which embraces an activity-based approach to learning in a group environment. This has been successfully achieved. The project team will reflect on any weaknesses and amend the module as appropriate in the future. A recommendation for further development is made below.*
- *To improve engagement by students. Results from the engagement survey indicate that this was achieved very satisfactorily.*
- *To devise more rigorous and equitable assessment methods in group projects. The project team do not believe that this was addressed satisfactorily in the time available.*

Other conclusions that were drawn from the project are as follows.

- Using an activity-based learning approach within a module enhances student participation and makes learning and teaching more enjoyable.
- Significant benefits accrue to teaching staff through team teaching. This was a definite and largely unforeseen benefit of the project. This came about by observing each others' teaching styles and interaction with students. It also arose from vigorous and animated debates about how to advance the project

- Recognising the varying abilities of students, the different levels of motivation and the social and educational dynamic that exist among different student groups, there is a need for in-built flexibility in both the manner in which teaching staff interact with learners, and in the challenge posed by each activity
- Management of the module was a significant challenge. This arose from the volume of assessments made. The project team intend to reflect on this with a view to streamlining the amount of assessment undertaken without compromising the integrity of the approach.
- Activity-based learning utilises more space compared to traditional lecture-based approaches and requires additional and flexible physical resources in order to be efficient and effective.
- For maximum impact, group size should be kept reasonably small. Our view is that three to four students is probably an ideal number for activity-based learning.

Recommendations to the DIT

The project team would recommend the following to the College of Engineering and the Built Environment, the Learning, Teaching and Technology Centre (LTTC) and the DIT generally.

1. The DIT might consider rolling-out this approach to learning Research Methods to relevant programmes in the College, initially and subsequently across the Institute. The team is aware that the module is framed in a social-science context and may need to be adapted to fit with more scientific type programmes.
2. The feasibility and desirability of an activity-based approach to learning across a wide variety of modules and subject areas should be investigated by the DIT.
3. DIT should develop and undertake an annual survey of student engagement similar to the National Survey of Student Engagement (2000). This could initially be piloted in one School.
4. The LTTC might investigate the feasibility and desirability of offering all staff supervising and/or assessing undergraduate and post-graduate theses a module in Research Methods, using an activity-based approach. This could possibly be developed as a short version of the Research Methods module offered by the LTTC. Alternatively, it could be offered as a series of half-day training programmes.
5. The DIT should encourage, where appropriate and where resources allow, team-teaching. This would be particularly appropriate to group-based projects with large classes.
6. The DIT might investigate the possibility of providing more user-friendly and flexible space to facilitate activity-based learning.

Proposed Future Work

The project team is considering

- developing an eLearning version of the module for wider dissemination throughout DIT
- developing a programme-wide student engagement survey.

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