Developing a Reusable Learning Object (RLO) to Support Traditional Lectures in Philosophical Logic

Project Lead: Andrew Fisher, Department of Philosophy

Project Outline

The project investigated the effectiveness of 'student-centred' learning using a reusable learning object (RLO). RLOs are popular within the sciences and medicine, but are used less frequently within the humanities. Even so, it seemed that philosophy students grappling with the core subject of philosophical logic would find them beneficial; and that, as such, they would be a good mechanism for investigating a selection of philosophy students' approaches to learning. The results indicate that the students took well to driving their own learning, and they appreciated the independence and the flexibility that the logic RLO offered.

Introduction

'Student-centred learning' is a phrase which is often used in education. However, what it means is notoriously complicated, and there is very little consensus amongst scholars concerning the best way of understanding it (Polsani, 2003). In fact, it has been suggested that 'many institutions or educators claim to be putting student-centred learning into practice, but in reality they are not' (Lea *et al.*, 2003). This project used a broad working definition of 'student-centred learning' that included the reliance on active rather than passive learning, an emphasis on deep learning

and understanding, increased responsibility and accountability on the part of the student, and an increased sense of autonomy in the learner (O'Neill and McMahon, 2005). With funding and support from the Centre for Integrative Learning, the project set out to test how effective this student-centred approach was when applied to the teaching of philosophical logic.

There is also debate as to how to best understand 'RLOs' (Polsani, 2003). As with 'student-centred learning', these issues of definition can be avoided by adopting a broad definition. The project took RLOs to be: reusable web-based resources with a single learning objective, with the functional requirements of accessibility, reusability and interoperability. RLOs were first developed for medicine and the sciences, but there is slowly a number of RLOs being designed for the arts and humanities. It was apparent from studying and lecturing logic that the issues it discussed were highly suited to the RLO structure. In particular, there is a clear learning objective, a clear starting point for each idea, and a procedure for reaching the correct end point. Furthermore, logic is often taught by splitting the subject matter into discrete subject areas (e.g. propositional logic, predicate calculus, truth-tables etc.), and by encouraging students to learn sets of rules.

Philosophical logic is a core subject for all first year philosophy students at the University of Nottingham, and the number of the cohort in 2008/2009 was eighty students. Students receive two hours of typical 'didactic' lecturing, with a series of in class tests throughout the course. After teaching logic, and listening to students for a number of years, two things are patently clear.

1. Students hate having to do philosophical logic.
2. Students typically are not very good at philosophical logic.

Moreover, a large percentage of footfall to lecturers' doors consists of students who need help practicing logic, and time is often taken comforting nervous and worried students. Given that a logic RLO would be well placed to meet some of these issues, it would be an excellent way of incentivising student participation in the project.

Integrative Learning Rationale

The project supported students by helping them develop the logical skills needed to complete their degrees. It involved the design and piloting of a virtual learning environment, viz. the Reusable Learning Object (RLO). The project met many of the CIL's aims, involving the construction of a new learning environment that allowed students to draw connections between different areas of their study, which they were encouraged to reflect on in a small exercise after the activity. The RLO is a benefit not only for philosophy students across the years and for future years, but could also be adapted for students in mathematics, engineering, computer science and economics. The project also involved meeting with a number of students to help them reflect on how the RLO has supplemented and integrated with their own learning experience.

Methodology

With the CIL's funding the project employed a software developer, and after an initial discussion we liaised at every main design stage. What was essential in the RLO's successful development was the maintenance and management of the input and feedback processes. The development of the RLO was as follows.

1. Identifying learning needs. To gain an insight into the learning needs the project ran a focus group with students, and consulted lecturers who had experience in teaching logic.
2. Storyboard creation. Various 'spec' sheets were drafted. Once there was a rough schema, this was peer reviewed. This reviewed design was then integrated into the software development and the RLO was build.
3. After a pilot RLO was developed anonymous questionnaires were distributed to 25% of the overall cohort of students. The questionnaire focussed on the ergonomics of the RLO: the fonts, pictures, usefulness of the listed resources, etc. This was all fed back into the final design.

To analyse the student's reflection and the student-centred approach, a two stage 'skills audit' was used. Students were asked to reflect on their skill set before and after using the final RLO. This helped to understand how the students judged their own skills, and how they viewed their learning experience.

Evaluation

The first results were qualitative and were gained from a focus group. These results then fed into the identification of the students' learning needs. The results were gained through a recorded discussion. This was 'free form', with a 'light touch' from the interviewer. The discussion centred on the experience of learning logic, the problems with it and what might help.

It became clear that practice and repetition was viewed as essential to learning. As one student noted, 'It's a bit like maths the more you practice at it, the easier it becomes. The penny is more likely to drop with a bit of practice.' Another theme that arose was that students felt like 'observers' in the lectures rather than

participators. There was a feeling of not 'engaging' with the material. What this suggests is that the students were not moving to a 'deeper learning' (Biggs, 1987). In part the evidence for such a claim derives from the way in which the students talked about the 'signs' in logic being just that – signs to be manipulated – rather than signifiers which denoted deeper interconnected, conceptual and philosophical issues. Furthermore, they saw the reasons for learning as externally imposed, with their normative force lying in the 'looming' assessment, rather than the intrinsic empowering nature of the learning itself. The focus group also confirmed that a drop in attendance at logic classes, which was typical across years, could be taken as an indicator that students were finding the subject hard.

The learning of logic consisted of one practice class a week that all students were supposed to attend. These were found to be useful as they gave students the space to reflect on their own abilities and 'gaps' in knowledge. This in-class practice amounted to setting exercises, which the students worked through in their own time. Then the answers were explained by the lecturer. However, even though useful, this seemed to reinforce the view to students that they were more like audience members, rather than a group actively engaged in learning. Thus, although valuable, students found the practice limited in its usefulness due to the numbers of exercises and the lack of real-time feedback. This lack of personalised, immediate feedback meant the students could not adjust, reflect and build on their skills in logic.

The most effective times were judged to be one-to-one tutorials with the lecturer. When asked to reflect why this was the case, students cited having more time to reflect, rather than being rushed onto the next thing. The lecturer could also target the practice to the individual, and correct the students as and when they made mistakes. However, as beneficial as this was, it was noted that 'People were very

reluctant to go and see the lecturer'. It became clear then that the learning could be supplemented; in particular, with an interactive reusable resource which could be accessed as-and-when needed. A further issues that was also highlighted was the need to be able to isolate and focus on a particular aspect of logic – that is, to break it into 'bite size' chunks (Mayer and Moreno, 2003).

From these results the project was able to develop a set of 'specs' to give to the software developer. These were used to develop the RLO so as to fit with the insights gained in the initial focus group. The RLO was precisely something which isolated one particular learning objective (in this case, truth-tables) and allowed the students to practice on their own. Moreover, the RLO has real time assessment allowing the students to alter and change their practice. Also, as we can see from below, the RLO facilitated a 'deeper' learning approach. Given the reusability and the 'anywhere/anytime' feature of the RLO, it acted as a catalyst such that the students felt able to take control of their own learning.

The next stage was about maximising the impact of the RLO in terms of how the students interacted with it, i.e. could they access it? Were the colours and fonts acceptable? Were the graphics suitable? Etc. To answer these questions an anonymous questionnaire was distributed. This allowed any issues to be fed back to the software developer before the final pilot was used to investigate the students' learning experience. The results from these questionnaires suggested that the RLO was very user-friendly. In particular, no one found any technical problem with running the RLO. Everyone found the RLO easy to navigate and aesthetically pleasing. Everyone found the activities appropriate; most found the self-assessment effective. The only negative comment was that there were not enough chances for self-assessment. When asked whether they would use the RLO again all said they would. General comments and suggestions were also sought, of which there was

only one: 'I thought it was all clear and well laid out'. All thought it would be a useful way of helping them in their other philosophy modules.

As such, it was decided to use the RLO as it stood. The result of the final focus group, using the skills audit and reflecting on their interactive learning were as follows:

Skill	**Negative Impact**	**Neutral**	**Positive Impact**
Logic			100%
Work Management	25%	50%	25%
Problem Solving		50%	50%
E-Learning		25%	75%
Knowledge Self Analysis		25%	75%
Learning Self Analysis		50%	50%
Seeking Help		50%	50%
Team working		50%	50%

The above data illustrates that after reflection the students felt that the most positive impact was in relation to their skill in philosophical logic, their skill in e-learning and their ability to highlight and reflect on gaps in their knowledge. This was also evident in the detailed comments, which included: 'I think my knowledge of logic has improved due to the information becoming more familiar'; 'This has helped my skill in e-learning, if it was always available I'd probably use it'; 'It makes logic so much more exciting', and 'There should be further RLO support. It's better being able to replay bits that are more difficult'.

Reflecting on this pilot RLO in philosophical logic makes it apparent that the students appreciate the ability to take ownership of their learning. They also appreciate the ability to have a resource focused on their actual needs, rather than what the

lecturer judges their needs to be. The RLO was a useful vehicle which facilitated reflection on how the students were learning, and gave them the space (without external pressure) to be honest with themselves and reflect on their gaps in knowledge. It is therefore suggested that the further use of the RLO would continue to encourage students to seek help; after all, it already had a positive impact on half the focus group. Indications from this project suggests that the RLO has such an effect because it started to give the students a grasp and familiarity with some of the more basic features of philosophical logic (symbols and truth-tables). This in turn gave the students licence to approach the lecturer for help (to put it crudely, they felt they were less likely to look 'stupid'). It is clear that the RLO was popular as it was requested to be on all philosophical modules. Of course, this would be a hard, but rewarding, task.

Future Developments

The main recommendation of this project is the formation of a network of RLOs based around philosophical logic. For not only has the project helped isolate and highlight the value of student-centred learning, it has demonstrated the value of the RLO as a stand alone learning tool.

Overall, the project shows the benefit of (a) student-centred learning and (b) this particular form of interactive e-learning resource. This RLO will be 'rolled out' to the full cohort of single honours philosophy students at the University of Nottingham in 2009/10.

References

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