



University of Glasgow: Institute of Biomedical and Life Sciences First year Biology

A REAP project case study June 2007

About the Class:

The first year Biology course at the University of Glasgow consists of two modules, Module 1X and Module 1Y, with typically 650-700 students annually. The modules are a requirement for students intending to progress into Level-2 Biology, but they can also be taken as optional modules by any student on a degree programme at the University of Glasgow. There are no entry requirements for these first year modules.

Module 1Y, which runs over a period of 12 weeks, is designed to provide students with a broad-based understanding of the basic concepts of Biology at the whole organism and population level. It also give them an opportunity to experience many of the Biological subjects in which the University of Glasgow offers Honours degrees; this enables students to make informed decisions about their Level-2 curriculum. The course also encourages the acquisition of general scientific skills relating to the systematic assembly, critical analysis, interpretation and discussion of factual information and data.

Module 1Y comprises 40 one hour lectures, delivered at 4 per week for 10 weeks, and 3 skills workshops. Students are also required to attend 2 tutorials, 7 practical laboratories and 3 discussion sessions during the course. For several years they have also been required to complete a group exercise in which up to 8 students work together to create a poster and also take part in a biological debate. The initial topic for this exercise was AIDS, but over the last 6 years the topic has been 'Lifestyle'.

Students are graded using two paper-based objective question assignments (15%), a laboratory report (15%), the Lifestyle Project (20%) and a 2-hour end-of-course examination (50%) comprising MCQs, short essays, calculations and sequencing questions.

Current Group Exercise: The Lifestyle Project

The majority of students studying Level-1 Biology at the University of Glasgow are interested in following programmes in human or whole animal biology. The Lifestyle Project was therefore designed to compare the lifestyles of humans in different countries and to investigate and evaluate the lifestyles of species other than humans. It was also designed to encourage students to develop team-working skills, acquire oral and visual presentational skills and to undertake independent research on topics of interest. All of these are essential to success at university, whichever course a student decides to pursue in subsequent years. A peer marking component was included in the Group Exercise in response to student feedback in a previous years, as a way to identify "passengers" in the group.

The Lifestyle Project is divided into three sections:

- (i) students work in groups to produce a poster which compares the lifestyle of a typical UK resident with that of a typical resident of another country
- (ii) groups of students select a species and argue for the extinction of their chosen species from the planet, on the basis of its destructive lifestyle, and for the retention of their opponents' species in a head-to-head debate
- (iii) students research and complete a problem, individually (8%)

Apart from two scheduled meetings, groups are expected to interact in their own time, and they do so in a variety of ways (email, text, face-to-face, in the pub). As there are only two sessions for



the group activities scheduled into the course timetable, many groups must meet outwith designated sessions. The diverse backgrounds of the Level-1 students in terms of other commitments (work, family, travel etc.), mean that many students cannot attend such meetings. This is a significant weakness of the current arrangements, which can limit the extent of the interaction of group members.

The group tasks (i) and (ii) are marked by two members of staff. The staff assess the quality of the debate presentations for and against each species, and also the ability of the groups to field questions at the end. The posters are marked against a number of defined criteria. The marks for the debate and the poster carry equal weighting and form 12% of the final mark for the module. In addition, students are asked to mark the other members of their group on the basis of their individual contributions to the debate and poster and according to a list of criteria agreed by the individuals in a group.

The method of peer marking used for the Group Exercises has evolved each year over the lifetime of the exercise (Cogdell *et al.*, 2004). In 2005-06 students allocated marks to the other members of their group on a confidential webform. Students were also asked to assess their own contributions to the group tasks and to write a short paragraph justifying this mark. In these ways our evaluation methodology does in some cases engage students in their own self-assessment, but only in an *ad hoc* manner.

Although the peer marking for most groups was processed automatically, without the need for manual intervention, in some cases the peer marking showed no clear pattern and in these cases group leaders and deputies would be consulted for further comments. This process of checking group marks and identifying unusual marking patterns is extremely time-consuming.

Student responses to the Lifestyle project are ascertained from a specific questionnaire that they complete during class time.

Drivers for Change

The main driver for change was to increase student motivation in Level 1 Biology, and thereby increase examination performance and also retention of students in the subject through first and subsequent years. It was intended to achieve this by enabling the students to be more actively involved in their own learning, and to participate in a greater range of group activities that allow the possibility of discussion, reflection, peer assessment and support.

It was our intention to implement the group activities through online discussion forums within Moodle, which has recently been adopted by the University of Glasgow as its main Virtual learning Environment (VLE). Moodle is particularly appropriate for the proposed pilot project on group activities as it is designed to promote a “social constructionist pedagogy” (collaboration, activities, critical reflection, etc), and contains dedicated Forum modules.

The main driver for embedding the activity within Moodle was to provide a more accessible forum for group interactions than previously available, and thus:

- improve the students' learning experience
- allow students to participate in the group discussions regardless of the timing or other commitments (family, travel, work etc.)
- avoid any problems arising from student absence and ‘no shows’, since all students in a group will have access to material ‘posted’ in the forum
- provide a permanent record of the group interactions for both students and staff

Performing the pilot project incurred a ‘cost to change’, but enabled procedures to be established for performing group exercises on-line. These offer the possibility for efficiency gains in future. This will apply both to students, who will be able to interact more efficiently using the on-line



forums, and also to staff, by providing savings in the staff time required to set up and monitor these exercises, and to investigate problem cases. These savings have allowed us to consider using these on-line group activities more extensively through the whole year, without a further impact on staff time.

Pilot Project: February 2007- June 2007

The pilot was planned to build on the current 'Lifestyle Project' in L1 Biology that already had the following features:

- skills tasks (poster and debate)
- participation of students in groups
- individual responses contributing to group discussion
- final agreed version of a deliverable that is used in poster and debate
- the "passenger" effect is dealt with by a confidential peer marking scheme

We wished to redesign these exercises to make it more explicit that they involve active engagement of students in their own learning, group interaction, self-assessment criteria, cyclical development and progression. We also wanted to introduce more effective tutor interaction and feedback, and to further develop the existing peer assessment procedures.

These exercises were intended to capture study time and effort outwith the timetabled course programme, and were embedded in a technological system (Moodle) which acted as an appropriate and effective on-line vehicle for these student-centred group activities.

The benefits of transferring the exercises on-line were:

- to provide consistent structured information
- to increase student autonomy and provides the with more extensive opportunities for active involvement in defining criteria. If students engage in determining the assessment criteria, then the number of problem cases may be reduced
- to allow difficulties with students and groups to be identified early
- to provide a way for additional engagement by students in reflection
- to provide a sense of taking charge of their own learning, making the university course seem different to their experiences in school
- to provide an efficiency gain in staff time

Pilot Tasks

Implementation of the pilot project involved the following steps:

1. Creation of an on-line structure within Moodle of closed forums for private interactions of group members (~80 forums with 8 members per group), and also an open forum for general interaction of all students and teachers (Figure 1). Initial technical issues with the stability of these on-line sites had to be resolved.
2. Pre-loading instructions into the Moodle open forum, and directing students to these. This made the instructions consistent for all groups
3. Releasing tasks progressively along a timeline, and defining the 'time on task' allowed for each
4. Requesting a series of defined deliverables to specific deadlines (which represent the identified on-line milestones)
5. Making these deliverables available to class tutors
6. Encouraging students to reflect at each stage (formative assessment)



7. Giving motivational feedback to whole class at intervals, via the open forum (in order to keep mutual contact)

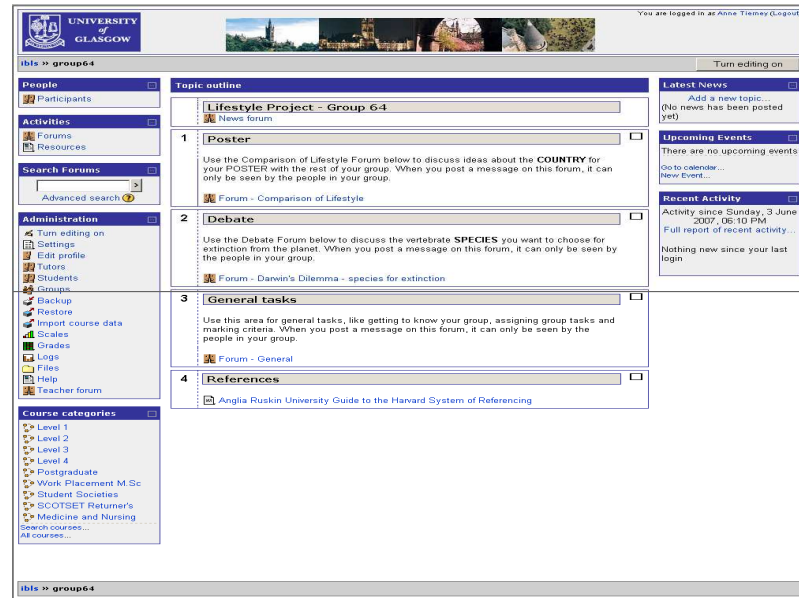


Figure 1. Lifestyle Project website for Group 64, illustrating the format of a typical group's site. Each site contained a news forum, a poster forum, a debate forum, a general forum and a resources list.

For each exercise the student groups were asked to:

- decide on the marking criteria they will use to distribute their group mark, by picking from a list presented or by choosing their own
- post this on their Moodle forum to be the agreed group criteria
- decide on their choice of topic(s) from the options offered. For the poster exercise this will be the country to compare with UK, and the aspects of their economies and lifestyles to include. For the debate exercise this will be the species chosen to argue for retaining on the planet, together with the reasons for this choice.
- post a brief rationale for their choices on their Moodle forum
- decide on the group leaders and the division of tasks (research, synthesis of ideas, presentation)
- post a brief summary of their presentations on their Moodle forum
- participate in the real event (create poster; participate in debate)
- After receiving their group mark, all group members assess their peers' individual contributions to the group tasks against their group's agreed criteria
- Return marks for other group members, and a mark for themselves together with a statement of justification, through a secure webform
- reflect on the exercise afterwards



Evaluation methodology

The elements that were available for assessment of the performances of the groups were all the deliverables they produced through the group exercises. The following were requested at regular intervals:

- list of peer-marking criteria
- rationales for choosing the topics for the poster and the debate exercises
- summaries of the group material for the poster and debates
- the poster
- group performance in the debate
- allocation of peer marks, with justification
- list of revised peer marking criteria

Some of these deliverables were necessary for the marking processes and for the allocation of group marks. Others (rationales, summaries) had the main objective of causing the group members to reflect on the processes in which they are engaged. Potentially, however, these also provide information to teachers that can be used to provide feedback, and to help shape teaching. Collation of these various deliverables was facilitated by them being available to the staff monitoring the forums in defined on-line locations and in a standardised form.

Methods for calculating individual marks following the peer-marking process were adapted from previous procedures, and involved asking for peer marks to be given as a percentage of a fixed sum, and by using median values in the calculation of an individual's mark from the peer marks received. These methodologies were developed in collaboration with the Department of Statistics.

Data were collected relating to group and individual marks for the group exercises and to degree examination performance. Use of the Moodle on-line forums was derived from the usage logs of this VLE. The student learning experience was evaluated using a combination of a "Lifestyle questionnaire" and a "Moodle questionnaire", and from the responses of a Focus Group run by an evaluation team from the Department of Psychology, University of Glasgow. The responses to the Lifestyle questionnaire were compared with those to the same questionnaire carried out in the previous year, when the Moodle forums were not used. The administrative time required to trouble-shoot the peer-marking process was estimated from the amount of email traffic between staff and students on this subject, and compared with the equivalent data from the previous year.

Results

Usage of the Moodle forums by the students

Table 1. Descriptive Statistics of Moodle activity by the Groups (N=83) and the Group Marks for the project components

	N	Min	Max	Mean	Std. Error
Total Moodle Traffic	83	114	1751	725.48	40.16
Student Moodle Traffic	83	67	1654	641.13	40.26
Staff Moodle Traffic	83	47	163	84.35	2.97
Number of deadlines met	83	0	7	3.08	0.22
Total Moodle Postings	83	0	96	38.63	2.57
Poster mark	83	31	89	59.72	1.26
Debate Mark	83	32	88	59.42	1.25



Over the 5 weeks of the project:

- Moodle took a total of 60728 'hits' (53406 from students and 7322 from staff).
- The number of hits made by students ranged from 0 - 640, with an average of 80.1 (\pm 3.3) per student.
- There were a total of 3219 messages posted on Moodle by students and staff.

Correlation of use of Moodle forums by groups with group performance

There was no correlation between the poster marks and the debate marks given to groups (Table 2). This was possibly due to the way most groups divided the tasks between members.

Table 2. Correlating Moodle use by Groups with Poster & Debate marks.

		Poster mark	Student Moodle Traffic	Debate Mark	Moodle Postings
Total Poster mark	Pearson Correlation		.331(**)	0.155	.341(**)
	Sig. (2-tailed)		0.002	0.160	0.002
	N		84	84	84
Student Moodle Traffic	Pearson Correlation	.331(**)		0.068	.891(**)
	Sig. (2-tailed)	0.002		0.540	0.000
	N	84		84	84
Total Debate Mark	Pearson Correlation	0.155	0.068		0.055
	Sig. (2-tailed)	0.160	0.540		0.618
	N	84	84		84
Total Moodle Postings	Pearson Correlation	.341(**)	.891(**)	0.055	
	Sig. (2-tailed)	0.002	0.000	0.618	
	N	84	84	84	

There were weak (but significant) correlations between the group poster marks and both the student Moodle traffic and the number of messages posted on Moodle (Table 2). However, there was no correlation between these measures of Moodle activity and the group debate marks. These differences in the correlations may reflect the different nature of the tasks: the poster marks were entirely based on written work, whereas the marks for the debates depended on how effectively groups were able to communicate ideas verbally.

Correlation of use of Moodle forums by individual students with the peer marks they gained from their group

Peer marks were corrected for total group mark and for the number of students in each group, using the same calculation as in previous years. The numbers of hits on the Moodle sites by individuals were also corrected for both the overall numbers of hits for the group and the numbers of students within each group. This gave a score of the relative use of Moodle by an individual within a study group. There was a highly significant but weak correlation between Moodle use by students and the peer mark they received from other group members (Table 3).

**Table 3.** Correlating Moodle use by individuals to peer marks for the group exercises

Non-Parametric Correlations					
	Individuals' Moodle hits	Proportion of 'moodling' individuals within groups	Individuals' peer mark	Proportion of marks by individual within group	Mark for Lifestyle Project
Correlation Coefficient	-	0.817	0.386	0.329	0.350
Sig. (2-tailed)	-	0.000001	0.000001	0.000001	0.000001
N	-	667	664	664	664
Correlation Coefficient	0.817	-	0.363	0.418	0.326
Sig. (2-tailed)	0.000001	-	0.000001	0.000001	0.000001
N	667	-	666	666	666
Correlation Coefficient	0.386	0.363	-	0.772	0.727
Sig. (2-tailed)	0.000001	0.000001	-	0.000001	0.000001
N	664	666	-	666	666
Correlation Coefficient	0.329	0.418	0.772	-	0.783
Sig. (2-tailed)	0.000001	0.000001	0.000001	-	0.000001
N	664	666	666	-	666
Correlation Coefficient	0.350	0.326	0.727	0.783	-
Sig. (2-tailed)	0.000001	0.000001	0.000001	0.000001	-
N	664	666	666	666	-
All correlations significant at p=0.001 (2-tailed).					

Lifestyle Questionnaire in 2006 and 2007

Many responses were very similar in both years. These relate to:

- the pace and workload
- the interest and enjoyment in the debate and poster exercises
- the relationship of the exercises to other parts of the course
- the assessment procedures and the principle of peer assessment

However, several responses showed a difference between the two years. Thus, in 2007 compared with 2006, there was:

- an increase of 7% (from 11% to 18%) in the numbers of students citing fellow students as a source of information.
- an increase of 4-6% (from 24% to 28% for debate, and from 20% to 26% for poster) in the numbers of students who felt that the group exercises were complementary to the rest of the coursework.
- an increase of 7% (from 58% to 65%) in the numbers of students who felt that the effort required for the posters was worthwhile.
- an increase of 8% (from 81% to 89%) in the numbers of students who said that they had used the peer marking criteria.

- an increase of 7% (from 16% to 23%) in the numbers of students who found that the marking criteria were very useful (Figure 2).

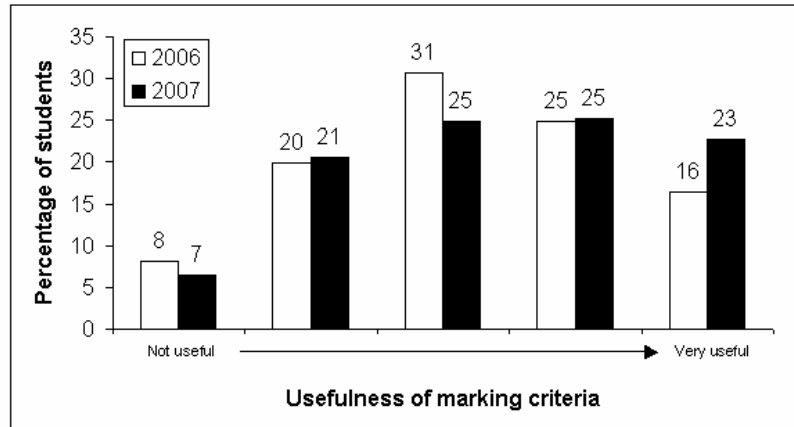


Figure 2. Responses on a 5 point scale to the question in Lifestyle questionnaire “Did you find the Group Marking Criteria useful?”. N=397 in 2006, N=443 in 2007.

Open responses

In both 2006 and 2007, 90% of students felt that the group exercises were a good way to learn. The biggest volume of open feedback in 2007 (94/154) was on the skills that the students felt they were acquiring as a result of the project. The “teamwork” element of the task was the most noted (69/94), with 40 of these being positive about the experience of group work, commenting that:

- the experience was “*fun, enjoyed, good, liked*”
- they learned how to “*work effectively as part of a team*”
- it promoted social cohesiveness
- it improved their “*interpersonal skills*”
- it helped their organisational abilities and time management skills
- it helped to encourage people to take responsibility for making deadlines
- it helped with becoming more confident in communication skills
- it aided their individual study skills

Of 100 open responses in the second part of the questionnaire (given only in 2007), 45 reflected a positive (interesting/ good/ worthwhile) overall response to the group project, and of these, 25 made specific comments about the group-work/social element of the project.

Eleven students made general comments suggesting that they enjoyed “*learning about biology in a practical sense*”, and 10 students noted that, because it was a “*different way to learn*” it was interesting: “*An interesting and effective idea, which should become a powerful learning tool with refinement.*”

Nine students stated that they thought it was enjoyable because it was ‘fun’: “*Group worked well together, and although it was a serious project, we managed to have fun with it which is very important...team work was good and everyone put in a good effort.*”

Six students commented on the nature of working in teams, two stating that they found it a ‘stimulating’ and ‘worthwhile’ experience, and 2 others noting that they enjoyed the responsibility



of working with other people. Ten students enjoyed it because of the social aspect of the task *"It was good to be working as part of a group cos it was motivational and allowed us to mix with other members of the lab who we wouldn't usually."* and *"It was lovely to bond with real people"*.

Eight students felt that the group sizes were too large, either because *"It was difficult to arrange meetings...due to timetable clashes. Also to keep track of the work everyone was doing."* and *"With so many people in the group it was sometimes hard when grading who did what or how much."* Two students were unhappy that some groups were "hindered by poor members".

Twenty-five students made specific comments about the individual components of the group work. Of the 13 students that commented on the debate task specifically, 9 made positive comments about the debate: *"It was good having to research for the debate, and was enjoyable partaking in the debate and hearing other students' points of views"*. Negative comments concerned the topics of the debate.

Seven students commented that they felt that *"maybe the poster and the debate shouldn't be the one project...divide between module 1X & 1Y instead of doing it all in a oner?"* The reasons for these comments fell into two categories: 5 students felt that having both at the same time was too great a workload, 2 suggested that the tasks helped *"build up communication with others in lab class"*. One student commented that the debate task *"should be near beginning of 1X"*. In the same vein, 4 students felt that the group project *"might be more useful earlier in the year as a way of getting to know people."*

Moodle questionnaire

- 87% of students (349/400) said that they did use Moodle to communicate with their group.
- 70% of students (306/428) stated that they used Moodle "often", and for this group the most use was for researching the poster, researching the debate and making postings (Figure 3)
- 80% of students (327/411) felt that the Moodle forum helped them to conduct their project more effectively.
- 96% of students (405/424) were aware of the deadlines set for specific tasks, and of these 90% (365/405) found them useful.
- 64% of students (267/416) were aware that Moodle could be viewed by a member of staff acting as a moderator, and of these 80% (214/267) stated that this made no difference to way that they used the secure site.
- 63% of students (238/380) reported that their group met face-to-face more than 3 times in the course of the project, and only 5% (18/380) met only once.

In open responses, 23 students made specific comments about their use of Moodle in the project. Sixteen students were positive about the individual sites set up for the groups to use, with 9 students finding it 'helpful'. The reasons for this being the case included:

- in communicating: *"I feel the assignment benefited from having the use of the Moodle site as it was very useful to be able to post information on"* and *"helpful as it allowed groups to always be in contact."*
- in coordinating of team members/arranging meetings: *"It is a good logical solution for people coming from different areas."*
- to review sources and catch up when meetings had been missed
- to refer to for evaluation of group members contribution. One student noted that it *"provided a record to refer to when allocating points to team members."*

Six students commented on the practicalities of using an internet based resource, with 2 noting that their groups communicated more using either MSN or text messages, and 2 students noted

that they “*saved money on phone bill ‘cos of Moodle ☺*”. However, 3 noted that because they did not have internet access they found it “*hard to keep up with things*”.

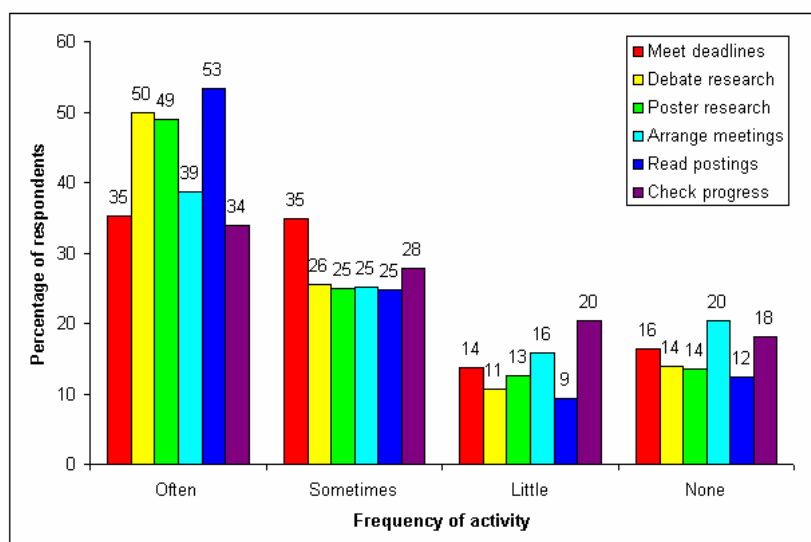


Figure 3. Responses to questions in the Moodle questionnaire concerning the level of usage of Moodle (Often to None) and the purpose of this use: (a) to meet deadlines (b) to post research for debate (c) to post research for poster (d) to arrange meetings (e) to read others postings and (f) to enquire on progress. N = 428.

Focus Group responses

The redesign of the group exercises to include the Moodle forums was unanimously valued by students in the focus group, mostly for its capacity to bring students together and create a more cohesive social and learning environment and a more pleasant atmosphere that was more conducive to effective learning. Moodle was very easy to operate and was a very useful way to communicate, particularly when it was not possible to meet up. As one student described, “*people would all put it under the different sections and it was a lot easier to go through that was and see connections*”. They regularly logged onto the forums and found them to be very useful for social network building and data pulling.

The redesign had also changed their behaviour in the labs by bringing people together in a more interactive way. For these reasons they would have preferred task-based group interactions to have been established earlier in the year, and that these were the groups that also had tutorials together on laboratory-based topics: “*you would be with a set group throughout the year that you would get to know and that would be easier*”.

The students felt reassured that staff had monitored their submissions in order to ascertain who had been working, and the fact that group members who did not contribute as much as others could be held accountable for their lack of effort by both staff and peers. They had agreed on and posted criteria for peer marking, and they found that peer feedback was a convenient method of instant support when expert advice was less available. The peer process generally worked well, with students opting to seek feedback from other students in the first instance, while trusting that staff were on hand if required for expert advice and to keep the peer feedback on track.

**Benefits for students:**

The objectives of the pilot were met insofar as there was a high level of group interaction (as indicated by the Moodle activity), the students generated their own self-assessment criteria and there was cyclical development and progression in carrying out the group tasks. The questionnaire responses indicate that students were very aware that they were actively engaged in their own learning, and that tutor interaction and feedback were available. The students found the peer assessment procedures fair, and saw a benefit in using them.

When evaluated in relation to the drivers for change, the outcomes of the pilot project demonstrate an improvement in student motivation and an enrichment of their learning experience. Students also reported positively on the effect of the group activities on the development of their skills in organisation, time management, interpersonal communication and individual study. The convenience and effectiveness of the on-line forums for group interaction was also highlighted. Overall, the students appeared to have enjoyed a positive learning experience enhanced by the strong social cohesion enabled by the redesign.

Benefits for staff:

One benefit of the pilot project to staff has been to provide an opportunity for reflection on the structure, timing and workload of the group exercises.

Staff have also been made aware of the great willingness of students to interact using the on-line forums, and of the positive contribution this has made both to interactive group work on-task and to the social cohesion of the groups, and thus the whole class, in general. The fact that a 'learning community' was effectively generated by the group exercises, and that this continued to operate in other areas of their learning indicates that group activities can provide an effective priming intervention to promote the active involvement of students in their own learning.

By considering all these outcomes, staff have reached the conclusion that the group exercises involving on-line group forums should be extended throughout the whole first year course (see Future Plans), with the joint aims of further empowering students in their own learning, and of creating an active learning community which will enhance the overall student learning experience of the L1 Biology course.

A particular staff benefit of the pilot has been to generate savings of time in resolving a number of assessment issues. The record of Moodle traffic and postings has provided useful information relating to the peer marking of problem groups, to cases of plagiarism in the group exercises and also to the determination of the final grade given in some cases.

However, perhaps more importantly, the staff see that more general benefits will flow from the redesign, since the planned interventions have been shown to enhance the cohesion and morale of the class. By creating a learning environment that is more conducive to both learning and teaching, the time given by staff to teaching will become a more enriching and satisfying experience.

Critical success factors:

The Institute of Biomedical Sciences (IBLS) at the University of Glasgow has international recognition for the development of innovative teaching instruments and methodologies, and the L1 Biology pilot has benefited from being built around an existing group exercise of proven quality and worth.

The engagement of staff members from the Biology Teaching Centre of IBLS in the conception and development of the project has underpinned its success. A wider circle of University



Teachers has also contributed, by ensuring that the student classes have been fully primed about the nature of the project and informed about the procedures for accessing the on-line forums.

A critical factor in the successful implementation of the project has been the ability to buy in dedicated assistance for a wide range of the tasks involved in running the pilot. These included setting up of the on-line forums, monitoring their use throughout the period of the project, posting instructions, checking the student postings, extracting the usage data and performing the statistical analyses for the evaluation. The engagement of personnel for these purposes was made possible by the funding through REAP.

Dissemination activities:

We intend to disseminate the results of this pilot project through talks presented to the GU Learning & Teaching Community at internal seminars, and presentations at appropriate national conferences. A research paper is also being prepared for publication in an educational journal.

Future Plans

A decision has recently been made in the Biology Faculty at GU to re-order the two modules that comprise the L1 Biology course. This will happen in the session 2007-08, and provides an early opportunity to build upon the pilot project. We intend to embed a modified version of the pilot project into the first module (Biology 1A), and also to extend it to other parts of the course, so that a programme of repeated but progressive exercises spans the whole first year. Groups will now be established in Moodle forums at the start of Module 1A, and will engage in the following exercises:

- establish a group profile through students making short statements about themselves
- conduct a small initial group exercise, linked either to a skills workshop activity (e.g., appreciation of the concept of 'plagiarism'), or to the lecture course (e.g. write a multiple choice question)
- attend all class tutorials in this established group structure
- take part in a revised group exercise, as developed from the pilot project, based on the Lifestyle Debate
- take part in a second group exercise in Module 1B, in which a Poster is prepared illustrating the importance of a biological molecule

Appendices

1. Lifestyle questionnaire and responses for 2006 & 2007
2. Moodle questionnaire and responses for 2007
3. Focus Group Report by the REAP evaluation team

Data awaited

1. Analysis of Moodle activity in relation to final degree grades (2007)
2. Quantification of the email traffic in 2007 compared with previous years concerned with resolving the peer marking of problem groups
3. Quantification of the progression of L1 Biology students to L2 Biology in 2007, compared with previous years