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Overview

<table>
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<tr>
<th>Title</th>
<th>Ecological Sampling Techniques (Summer Term 2007)</th>
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<tbody>
<tr>
<td>Pedagogic theme</td>
<td>Group-based data collation and analysis</td>
</tr>
<tr>
<td>Keywords</td>
<td>Data management; feedback; reflective learning</td>
</tr>
<tr>
<td>Subject area</td>
<td>Biology; field ecology</td>
</tr>
<tr>
<td>Student level &amp; profile</td>
<td>2nd year undergraduate students in Biology. (5 credits)</td>
</tr>
<tr>
<td>No. of students</td>
<td>31 Students</td>
</tr>
<tr>
<td>Key conclusions</td>
<td>1. Incentives are necessary to foster a good initial level of student engagement with the Yorkshare tools. This might take the form of giving students credit for online activity or providing them with individual feedback. Once students become accustomed to the tools and understand their role within the course, they will attach a stronger value to the online learning activities and their contribution to their overall learning within the course.</td>
</tr>
<tr>
<td></td>
<td>2. The blog may be configured as a personal journal, providing a space for each student to reflect on individual progress and a safe place to ask questions and invite feedback from the course instructor. A personal space may foster a greater level of reflection than an open space such as a discussion board, and will enable the instructor to address individual learning needs.</td>
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<tr>
<td></td>
<td>3. The VLE can save time in the collation and management of data, which can be reallocated to other, richer, activities. Some communication tools such as the blog and discussion board may need to be monitored daily, depending on the activity but other tasks can be streamlined and made more efficient.</td>
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<tr>
<td></td>
<td>4. Planning and preparation is vital to speedy site construction and smooth implementation. Site structure should grow out of clear aims and pedagogic objectives. Familiarity with Yorkshare’s capabilities can also help to shape the course and inform appropriate selection of tools.</td>
</tr>
</tbody>
</table>
Background

Ecological Sampling Techniques is a second-year undergraduate module. It is a non-compulsory, 5 credit module in scientific and transferable skills. The aim of the course is to give students hands-on experience of plant and animal sampling, data handling and analysis. Students work in groups to undertake plant and animal sampling on campus, before returning to the lab to collate the data into a class data set. They then use these data sets for practical experience of data handling and analysis, and finally write up reports on their findings.

Twenty-one hours of contact time is divided into seven 3-hour weekly practical sessions. In addition, students are expected to complete twenty-nine hours of private study. Students write up four practicals in two assessed pieces of work.

Dr. Thorunn Helgason had previously run the module without the use of the VLE or equivalent system. She redesigned the course as a blended module, with the primary aim of using the VLE to streamline data collection and dissemination, as well as promoting students’ data management skills.

In the past students collected data from practical experiments which they submitted in class on paper, and Thorunn had the task of collating that data and distributing it to students in electronic form. This was time consuming for Thorunn and she observed that students did not immediately understand the data once it was returned to them, because they had not structured it in a recognisable format for themselves:
"The rationale for putting it on the VLE was first and foremost that the data collection was primarily the tutor’s responsibility: each group would collect all their data on scruffy pieces of paper, hand it to me at the end of the class and I would spend the next 24 hours trying to decipher all this and put it all in to Excel, and then try to find a way to deliver it back to the students so that they could actually utilise it when they were data handling. So it was not student-led, they did not have ownership of it. Then when they finally got the data, they would spend the first half hour trying to work out what it all meant because they had not typed any of it in, nor could they see their own data in it. I wanted to change that."

The use of the VLE also presented opportunities to improve other elements of the course, including the demonstration of equipment and support towards the development of students’ time- and project-management skills.

The nature of the course presented very particular problems with demonstrating sampling equipment. Demonstrations depended on suitable conditions such as the weather, but also time of day and even time of year. For example, moth trapping must be done at night and is not easily accommodated in class time. Mammals cannot be trapped in the summer:

"Animals are wandering around campus that have babies in nests so you really should not trap mammals between April and July." [Indeed it is not legal in some cases...]

And sometimes the weather can be an obstacle:

"It is important to get the students outside – but you are standing on the top of a mountain in a force 10 gale and you are trying to explain how to use some method and it just doesn’t work.”

The use of the VLE targeted the improvement of students’ access to tutorials in sampling techniques by making electronic resources available.

Finally, the VLE was used to structure students’ research and project management activities by providing students with electronic tools for reflection, writing up and receiving feedback.
Description of approach

The blend for this module was based on seven face-to-face practical workshops, which were supported by an online study component. The VLE supported the face-to-face sessions by:

- Streamlining data collation from the practical work.
- Supporting collaborative work – in particular the group-based data analysis activities.
- Promoting self-study and reflection – supporting individual reflection on the practical work and data analysis.
- Providing additional supporting resources.

Learning activities & tools

The online component of the module included:

- **Course Materials.** Handouts for all the practicals were available online as well as statistics notes, analysis notes, safety notes and a link to a departmental webpage for downloading necessary forms.

  ![Screen image of the Course Materials of the module](image)

- **Practical journal.** A blog tool was used by students to write up results from the practicals as they went along. Students were only able to view their own posts. They received feedback from the tutor on their first analyses to inform their assessed work.

- **Data Zone.** A submission point was set up using the assignment tool, which groups used to submit data gathered during the class activities. A data template was
also provided, so that students were clear about the form in which to present the data.

- **Class Data Sets.** A display area was set up by the course instructor to present collated data sets for students to access and analyse.

- **Movie Zone.** Three short films on malaise, mammal and moth trapping were created, demonstrating techniques that would not be covered in detail in class. Students were encouraged to view these in their own time.

- **Discussion Board.** A blog was set up for general course discussion. The commenting function was used for one of the blog posts to set up a tutor-free space, where participants could discuss aspects of the course and support each other. Tutors periodically checked the forum to ensure that it was being used appropriately, but did not intervene in the discussions.
Student profile

The students following this course were 2nd year undergraduates in Biology. All students undergo departmental computing training including training in the use of Excel spreadsheets, which was necessary for this module. They had prior experience of the VLE from following the ‘Environmental Issues’ module, which entailed the use of a discussion board and file exchange, supported via Yorkshare. 89% of students had previously used the assignment tool or another file upload tool in Yorkshare. However, the use of blogs for reflection and using the VLE for online data submission were new to students.

Outcomes of the module

The module was delivered in the summer term 2007 (weeks 3 to 10). Students collected data in the field and attended seven 3-hour workshops. Feedback was collected from the instructor at the end of the course and from the students via an exit survey, before their final assessment.

Activity statistics

Student log-in patterns peaked at induction in May and were steady until the end of the course in July. All students visited the site more than 10 times with the majority, 26 students, visiting more than 50 times.

Table 1: Number of logins

<table>
<thead>
<tr>
<th>Number of logins</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;100</td>
<td>9</td>
</tr>
<tr>
<td>&gt;50</td>
<td>26</td>
</tr>
<tr>
<td>&gt;25</td>
<td>30</td>
</tr>
<tr>
<td>&gt;10</td>
<td>31</td>
</tr>
</tbody>
</table>

Students accessed all areas of the site, with fewer visits to the movie zone, because this resource was only made available part way through the course.
Table 2: Hits by Content Area

<table>
<thead>
<tr>
<th>Content Area</th>
<th>Hits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movie Zone</td>
<td>4.22%</td>
</tr>
<tr>
<td>Class data sets</td>
<td>15.94%</td>
</tr>
<tr>
<td>Course materials</td>
<td>36.23%</td>
</tr>
<tr>
<td>Data Zone</td>
<td>18.16%</td>
</tr>
<tr>
<td>Practical journal</td>
<td>22.88%</td>
</tr>
</tbody>
</table>

Practical Journal

The practical journal was used by 28 of the 31 students. The blog tool was used to encourage students to write up practicals throughout the term and to encourage reflection on their own learning. Participation carried 5% of the mark and students were also incentivised by feedback from Thorunn on their early posts, which was used to inform their final write-ups.

Students used the journal throughout the term with the number of posts remaining high in May and June. Students made between 2 and 15 posts each.

Table 3 below presents the number of student posts in the personal journal

<table>
<thead>
<tr>
<th>Number of Posts</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 5</td>
<td>19</td>
</tr>
<tr>
<td>6 - 10</td>
<td>6</td>
</tr>
<tr>
<td>10 - 15</td>
<td>3</td>
</tr>
</tbody>
</table>

The difference in the number of posts is not always simply related to engagement and may be indicative of different styles of use. Generally, those students who made a small number of posts (2-4) made longer posts. For example, one student might make a number of posts, submitting their reports in piecemeal fashion, one section at a time. Another might post a draft of the whole report and, as a result, make a smaller number of posts in total.
Feedback from the lecturer acted as a good incentive to participation. Thorunn gave detailed feedback on early drafts of the first practical write-ups, to encourage students to participate and to help them to improve their assignments:

Hi [student], good to see you making a start on this. Just a few points to note...Hope this helps - keep up the good work.

Hi [student], This is fine: you might want to make the introduction more specific, and note that Bellis has a capital letter. Also think about how you describe the analysis: in this case, we used a chi sqr goodness of fit test to test whether the observed frequency distribution of daisies differed from the poisson distribution you would expect if they were random. So you need to be more specific here.

I seem to have come across a difficulty in plotting the rank abundance curves as I can't decide whether species with the same abundance should be given the same rank or different ranks. Which of these is done obviously changes the shape of the plot completely and I can't seem to find any information anywhere about which is the correct way to do things. This was an unexpected use for the personal blog but a valid way to use the tool, which allowed Thorunn to give targeted feedback.

Hi [student], the groups with the same abundance will be assigned consecutive ranks arbitrarily. Thus if the abundances are say, 10, 8, 7, 7, 3, the rank of those taxa will be 1,2,3,4,5 and it doesn't matter which taxon with an abundance of 7 gets the rank of 3 or 4 - the plot will look the same. Does that make sense?
Not all students found it easy to paste their graphs into their blog entries. This meant that some of their early posts were incomplete. Thorunn provided instructions in the comments section when problems occurred.

**Discussion Board**

A forum was provided for general queries about the coursework to be answered by Thorunn or students. The discussion board accounted for 27% of hits but was not widely used, with only 10 posts made by 7 users. This suggests that students visited this area of the module site but did not post to the forum. Only six students posed questions. Thorunn accounts for this as an effect of moderating the forums which introduced a time delay:

"I think what was very inhibiting was that, to avoid issues of collusion and academic misconduct, I made it fully moderated. This meant they did not immediately see their posts appear on the discussion board, because I had to check them first, and I think that is hugely inhibiting: it just didn’t work."

There may also have been other factors. Not all posts received a reply on the discussion board. This is not to say that these queries were not addressed through other channels but it may have contributed to a sense that the discussion board was inactive.

There were no other incentives to participate in the forum as it was not linked to assessment. It may also have been that as students were incentivised to post to the practical journal, they were more accustomed to this tool. It also had the advantage of being a private space, with students only seeing their own posts. Thorunn notes:

"The blog...is the preferred route for students to ask questions. It is natural that students are cautious and some may find it difficult to ask questions during class or using other means. It is nice to offer them a private arena to do this, but I could publish answers in public for all to see.”
Exit survey feedback

9 students completed the exit survey, which invited them to reflect on their expectations to the VLE based on their experiences following the course.

**About the use of Yorkshare to support learning**

The module was rated highly when students were asked to compare their experiences of the module with earlier practical modules that were not supported by Yorkshare.

**About the Practical Journal**

| Table 4: Selection of results from the entry and exit surveys about the practical journal |
|----------------------------------|---|---|---|---|---|
| **Using the journal meant that I completed the analysis write-ups quicker than I normally would have done.** | 0 | 44.4 | 33.3 | 22.2 | 0 |
| **Using the journal was an extra burden I could have done without** | 11.1 | 11.1 | 44.4 | 33.3 | 0 |
| **The feedback I received on the journal helped me with subsequent write-ups** | 22.2 | 66.7 | 0 | 11.1 | 0 |
| **Having the journal was useful for keeping track of my progress** | 0 | 33.3 | 22.2 | 44.4 | 0 |

**SA:** Strongly **A:** Agree **N:** Neutral **D:** Disagree **SD:** Strongly Disagree

The strategy of using a personal blog to help students manage their time appears to have been generally well received. Tutor feedback was appreciated by students. 89% of respondents agreed or strongly agreed that the feedback received on the journal helped them with subsequent write-ups. Opinion was divided about whether the journal was a ‘burden but, overall, students seem to have found that the journal was of value as a reflective tool.

**About the use of Yorkshare to support learning**

The module was rated highly when students were asked to compare their experiences of the module with earlier practical modules that were not supported by Yorkshare.
Table 5: Students were asked to compare their experience of the module with earlier practical modules without Yorkshare support.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Percentage of students selecting this statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>More flexibility in when and where I work</td>
<td>66.7%</td>
</tr>
<tr>
<td>Easier sharing of data</td>
<td>100%</td>
</tr>
<tr>
<td>Easier access to resources and guidance</td>
<td>77.8%</td>
</tr>
<tr>
<td>Own progress more transparent to myself and teaching staff</td>
<td>66.7%</td>
</tr>
<tr>
<td>More useful feedback on my work</td>
<td>66.7%</td>
</tr>
<tr>
<td>Easier to ask questions and receive responses</td>
<td>66.7%</td>
</tr>
</tbody>
</table>

The results suggest that Thorunn achieved her stated aim of improving data management, with 100% of respondents agreeing that Yorkshare made sharing data easier. Benefits in terms of receiving feedback and answers to questions were also noted.
Course leader’s feedback

Thorunn reports that the use of the VLE significantly improved the data management aspects of the course. Students made good use of the assignment submission point and the process was made more transparent:

“The students were happy with it, I think they were very comfortable with it; most of the data came in on time. If it was not coming in on time I knew who had not handed it in and I could email them directly or put notices up in the ‘announcements’ area, to prompt a response.”

From the tutor’s perspective, data handling was much improved and the Yorkshare tools saved a lot of time. With the students submitting data electronically in standardised form, data collation was much more efficient. Thorunn recommends:

“If there is any complex data collation that you have to do in your course, do it via the VLE. I have yet to come across any email or web deposit based system that does it better.”

Overall the module required more day-to-day management and Thorunn visited the module site daily but this was felt to be manageable given the time saved in data management. Overall the workload was not found to be significantly greater:

“Potentially it is time consuming to provide feedback on student work, but it is a trade off in terms of the time saving in the data collation. The technology is great in that it allows you to utilise time on something else, which is richer (more useful).”
The ‘Movie Zone’ was considered to be a useful resource and will be developed further. As the video tutorials took longer to develop than anticipated they were not as well embedded in the module as hoped. This will be improved when this course runs again.

Students did not perceive the value of the personal journal at first and the incentives of tutor feedback and 5% of the final grade were necessary to encourage them to participate. However, students did see the worth of the tool later on and levels of engagement were higher than expected.

**Student skills required & developed**

Students had some prior experience of using the VLE. Nonetheless, the first practical took place in the computer lab and gave students hands-on training in using the specific tools in the VLE needed for this module.

“We used it in class time actually quite a bit and therefore all students have actually logged in at some point or other.”

In this first session, students collected data and were guided to type this into an Excel template. This was also an opportunity for Thorunn to demonstrate tips on using Excel.

The VLE was integrated with all the practical sessions. Computers were set aside at the end of each class for the groups to post their data straight away. In addition, students were sometimes asked to retrieve data from the module site in class and given a short time to perform an analysis.
The online element of the course was intended to support students to improve their data management and project management skills. Excel templates, completed and submitted online, encouraged students to take responsibility for data management and reduced the tutor’s role in supervising data submission. Students responded well to this aspect of the course and data was submitted on time, with students getting to grips more quickly with the collated data. However, as data was collected in groups, only one person from each group needed to upload the data each week. Thorunn estimates that about half of the students posted data on behalf of their group, with the rest of the students not acquiring this skill. Thorunn found that students who posted data once were more likely to do so again.

“So basically half the class were group data posters, half the class never did it. I am not sure whether that is a good or a bad thing but I think it allowed people who did not feel comfortable with the software not to do that particular job.”

The practical journal – a personal blog – encouraged students to write up as they worked, avoiding a heavy workload at the end of the course and managing their time more effectively.

Thorunn gave feedback on early posts as an incentive. In addition, 5% of the course credit was dependent on use of the journal. An unanticipated benefit was that students also used the blog to develop their report writing skills:

“They were specifically asking things about how to write up their reports, which is not something that I have been able to feed back to them during the course at all before.”
Staff skills required & developed

Thorunn drew on her previous experience of working for the Open University but also found the ELDT training workshops useful. She advises:

If you are starting from scratch, you should dip into the full range of workshops...you shouldn’t assume that you know the course that you will need.

Thorunn found the Blended Learning workshop particularly useful, as well as the training in assessment tools.

The set up of the site was quicker than anticipated, as a result of thorough planning of the module structure and navigation.

“The key is to plan and plan. You need to find out what the VLE can do and decide what you need from its capabilities. Implementation is then surprisingly quick. From a skeleton outline it is very quick, but you do need first a logical directory structure.”

Thorunn also suggests that careful planning meant that she avoided being distracted by the range of tools available. Having a clear brief and knowing what the site needed to achieve was essential to selecting the most appropriate tools.
Actions for further development

The module ran successfully and next year it will increase to 10 credits and a lecture component will be added. Thorunn would like to introduce self-assessment quizzes on the new lecture content and exercises on calculations.

The filmed demonstrations were judged to be useful resources that will need to be extended and more effectively embedded in the course in the future.

“We definitely need to try and embed, blend that into the teaching more effectively and actually that if they are live earlier then we can build a practical around them in a more effective way.”

This was not the case this year, due to the time needed to produce the films at the appropriate times of year and times of day. The result was that they came online too late to be of maximum benefit to students. In future, the movie zone will be developed further and the existing films will be introduced to students earlier in subsequent instances of the module.

Thorunn also plans to have her own blog on the site and to post specific comments about write-ups and make general comments that the whole cohort will be able to see. The blog tool was used as a private journal this year and so information was not easily shared across the group. Although it was useful for students to have a private space to ask questions, giving them the confidence to ask things they might otherwise not raise, the observational learning dynamic was lost. It is hoped that a course level blog will remedy this.