

Peer review of team assessment exercises in Medical Microbiology

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Background

During the 1990s, there was a steady rise in the number of students reading Medical Microbiology as part of their final undergraduate year reading Microbiology programmes in Leeds. This increase in student numbers was not matched by a similar rise in the staff available to teach and to assess the subject. Furthermore, a significant proportion of the teaching was delivered by clinicians with part-time university contracts. As module manager responsible for the assessment of the Medical Microbiology teaching and the only full-time university employee associated with the module, it fell to me to carry out all of the in-course assessment. With increasing student numbers, individual assessment of every piece of in-course assessment was becoming over-burdensome.

One of the intended learning outcomes of this module is to “...to develop your visual presentation and other communication skills”. Traditionally, students had developed these skills by production of an essay and also a newspaper-style report of cases of life-threatening infections. Although preparation of an essay remained an individual task, the production of newspaper-style articles, aimed at an audience who do not necessarily have a scientific background, seemed particularly suited to conversion into team exercise.

With the widespread use of the internet and as easy web-authoring tools became available, the focus of the team exercise switched from producing articles in the style of different newspapers to developing websites devoted to life-threatening infections.

The rubric for the team exercise, shown in Appendix 1, indicates that pages are to be written in HTML only. This point is further emphasised in the oral explanation of the team exercise. Web pages for educational uses need to be readily accessible across the globe and not just by people who have access to the latest browser technology. Also, student IT skills vary very significantly. Some students remain technophobic while for others, designing websites may make a profitable side-line to their studies.

‘How to do it’

The most important feature contributing to the success of team exercises is explaining carefully to students the benefits that they will get from team exercises and the benefits that accrue from peer assessment. Used properly, the system that I employ allows the team mark to be moderated by almost half a degree class for different team members. This is done by allowing students to give or remove up to 2.5% from the team mark to individual members. The proviso, however, is that at the end of the procedure, the balance of marks has to be zero. The reason that the moderation of a team mark potentially results in an alteration that is slightly less than half a degree class is that students cannot reward or punish their own efforts. In essence, once a team mark is allocated, this is moderated according to the peer assessment feedback that I have obtained. The total positive and negative marks for individual students are recoded and the team score is adjusted accordingly.

Team size is another important feature. Four or five seems to be the best number of students in a single group. Three is too small; six becomes unmanageable. I allocate students to groups; team exercises that count towards the assessment of degree classes may cause frictions between friends that are easily avoided by imposing teams externally. I also avoid the simple alphabetical allocation method to place people in teams. This is widely used to allocate lab partners and so on. By using a random number generator to allocate teams, no bias is introduced. In Excel, the formula “=ROUND(RAND()*(50-1)+1,0)” generates random integers between 1 and 50. Remember to copy

and paste values before sorting your spreadsheet if using this method to allocate groups. Students see this as a “fair” method of allocating team members.

Over a number of years, I have found that stating from the outset that through peer assessment of team exercises the good student will not be made to carry the weak student, and illustrating this with an example allows reassurance to students that they will be treated fairly. I take time at the beginning of the practical class on which the team exercise is based to explain verbally to students what is required of them and to answer any queries that they may have. Additionally, I provide an individualised written explanation and mark *pro forma* on paper, reproduced in Appendix 2. This includes an illustration of how the marking system works and lists the team members to be assessed by the named individual. Students appreciate the personalised approach.

I explain that null returns are acceptable. In the early days of team exercises for this module, this was the typical result. As students are exposed to peer review in other modules and at lower levels of study, they are more comfortable with the process and seem happier to reward the efforts or indicate the shortfalls of others.

Tips

The best advice I can give in introducing peer assessment is to take time to explain the system to students and to provide illustrations

What problems have arisen?

The biggest problem with this process is when students find that it is difficult to work as part of a team, particularly where there is someone on the team with whom they develop a difficult relationship. I have experience of this manifesting itself in the anonymous peer marking process. Both individuals gave the maximum negative mark to the other student involved, sharing the positive mark equally among the other team members. On speaking separately to each of the individuals concerned, it was admitted by both parties that there was a clash of personalities that was difficult to foresee when the group were allocated. Since each student had disadvantaged the other equally and since this reflected a difficulty with working as part of a team, it was decided that the maximum negative mark for both should stand; each student received the same penalty for poor team work.

Does it work?

Student feedback has always been positive and it certainly saves considerable effort in marking assessment. The work is not cut to one quarter of that before team exercises were introduced; team exercises yield a larger body of work than some individual exercises. Nevertheless the saving in marking time is considerable. It also encourages students to work as part of a team.

Further developments

Having successfully used peer assessment of team efforts in Medical Microbiology, I would like to introduce team assessments into other modules. I know of one 40-credit module where students have $\pm 5\%$ with which to reward or punish team members. This works well for that module. The message from that experience is that the greater the contribution an assessment makes towards degree classification, the more influence students should be given relating to the moderation of team marks.

References

Gibbs, G., Jenkins, A. and Wisker, G. (1992) *Assessing more students*. Oxford Brookes University Available from: http://www.brookes.ac.uk/services/ocsd/4_resource/books/tmspubl.html

Appendix 1

Team Exercise Rubric:

MICR3290 Medical Microbiology Team exercise 2003

You are to design a set of web pages to educate the general public on any aspect of life-threatening infections that your team considers of importance. As a guide to size, I do not want to see more than six individual linked pages of no more than two screen lengths. You may, however, provide links to external sites if you want to provide more information. You may use images but you **MUST NOT** breach copyright. Make sure all your links work! You will be assessed on the accuracy of the information provided and on the attractiveness of your design. The deadline for handing this work in is **noon on the last day of term**.

Your pages must be written in HTML only. Pages with 'Flash', Java, JavaScript, *etc* will be penalised, as will pages saved as HTML from a WORD document. You may wish to use Netscape Composer to generate your HTML. This is like using a word processor. It does 'cheat' with some of its coding but it produces good results with little effort. Alternatively, if you feel adventurous, you may wish to use 'Dreamweaver' – a professional web development program. Both are available from the ISS desktop by accessing the Internet Tools option on the 'start' menu. Alternatively I have developed a site that explains HTML tagging (<http://www.bmb.leeds.ac.uk/mbiology/ug/ugteach/micr3290/notes/authoring.htm>).

Appendix 2

Individual marking *pro forma*

*Team exercise Peer Assessment - C***** N******

The majority of marks will be awarded for the team effort, but as the assessor of the final effort, I cannot judge the individual contributions each of you makes. You are therefore asked to indicate the contributions that *you* consider each of your fellow team members have made. This is done by allocating a mark of between -2.5% and +2.5% to each of the members of your team with whom you have worked. The overall mark that you return should be zero: equivalent to an equal effort on every team member. To illustrate, let us consider an extreme example; a team has one idle member three who make an average effort, and is led by a member who is outstandingly productive. You, as one of the average students, may decide to allocate -2.5% to the first student and 0% to the other average students. You must then allocate +2.5% to the outstanding individual. The allocation of marks is, of course, up to you. If the allocation of marks across a group appears to me to be discrepant I will arbitrate, and the team and I will come to an agreed mark for individuals. The final mark awarded will be the team mark plus or minus the average peer assessment allocation. You should note that the flexibility that you have been given is equivalent to half a degree class from the worst possible performance to the best. Please fill in the form below and place it in my pigeonhole before the end of term. If your form is not returned, I will assume that no alterations to the team marks are required.

Student Name	± % Mark
L***** H*****	
D***** H*****	
A***** C*****	
H***** Z*****	

Dr John Heritage, November 2003

Appendix 3

Text from

<http://www.bmb.leeds.ac.uk/mbiology/ug/ugteach/micr3290/notes/authoring.htm>

Writing HTML files

If you are having trouble writing your web page using authoring software, you could always do it the hard way. There are just a few 'tags' that allow you to compose a page. Writing web pages is like very old fashioned word processing. You have to tell the browser when to start an effect and when to finish. To do so, you use tags in angle brackets. For example if you want your text to appear **bold** you must tell the browser to start the bold text with the tag ``. To stop showing bold text, you use the close command ``. Similarly for *italic text*, the opening tag is `<i>` and the closing tag is `</i>`. The forward stroke indicates the end of the command. If you want both **Bold and Italic** text, make sure you nest your commands right. The HTML will look like this:

. . . both `Bold and <i>Italic</i>` text. . .

The italic command was started last so finishes first. Note that the case of the tag doesn't matter; you could use `` `` for bold and `<I>` `</I>` for italics - try not to mix cases. Actually, if you look at the raw html for this page, you may be confused. To show angle brackets, you need another bit of code - `<` will show a 'less than' tag (`<`) and `>` will show a 'greater than' tag (`>`). The reason is, if I were to use the actual '`<`' or '`>`' then the HTML would think I was starting and closing commands.

It is good practice but not essential to tell the web browser that it is dealing with HTML. The whole document can thus be tagged

`<HTML>`

...Stuff...

`</HTML>`

Web pages have header bars with titles. To do this you need two tags, `<HEAD>` and `</HEAD>` define what is in the head and `<TITLE>` Place your title here `</TITLE>` defines the title. If you remember your nesting the page head material will look like this:

`<HEAD>`

`<TITLE> Place your title here </TITLE>`

`</HEAD>`

Other things may appear in the header section. These are to help browsers but for the purposes of the assessment exercise, you needn't worry about them.

You don't, however, often find a head without a body. The next tag pair to learn is `<BODY> </BODY>`

Anything you see on your web page lies between these tags. So now we can build a template for a complete web page...

```
<HTML>
<HEAD>
<TITLE> Place your title here </TITLE>
</HEAD>
<BODY>
```

...Stuff...

```
</BODY>
</HTML>
```

You can modify the body of the page to have default colours for the page and its text. This is too complicated to detail here but the attributes for this page include the following: `<body bgcolor="#FFFFCC" text="#3333FF">`; 'bgcolor' defines the background colour 'text' defines the colour of the text. The letters refer to the strength of the three guns in the VDU.

Here is a brief guide to common tags you find in the 'Stuff' bit of the web page and what they do:

A big title is achieved using the heading tag. There are various levels of heading. One is the largest, two is smaller and so on down to Level 6

This is Heading 1

This is Heading 2

This is Heading 3

This is Heading 4

This is Heading 5

This is Heading 6

The tags to do this are `<h1></h1>` to `<h6></h6>`.

These are not centred on the page. To achieve this, use the `<center> </center>` tags (not the American spelling).

This is Heading 1

This is Heading 2

This is Heading 3

This is Heading 4

This is Heading 5

This is Heading 6

The HTML that would produce this is:

```
<center>
<h1>This is Heading 1</h1>
<h2>This is Heading 2</h2>
<h3>This is Heading 3</h3>
<h4>This is Heading 4</h4>
<h5>This is Heading 5</h5>
<h6>This is Heading 6</h6>
</center>
```

To create linebreaks use the `
` tag. Paragraphs are generated using the `<p>` tag. These tags can have close tags (`</br>` and `</p>`) but do not need them.

Similarly a horizontal line is generated with the single `<hr>` tag...

If you want to link to a site, use the ` ` tags around the [text](#) that will form the link. URL can either be a full path such as <http://www.leeds.ac.uk/mbiology/index.html> or it can refer to another file in the directory in which you are working, such as [back.html](#) the file to the text link above.

You may wish to jump to another position on a page. To define the anchor you need to use the tag pair `<A>` where "name" is the name of the anchor point to which your reader may elect to jump. To create a link to take you there, you need to use the command `link`.

Pictures enhance web sites. To include this picture. . .



use the tag `` In this case the file is a gif file, univ100t.gif.

The "alt" bit of the command shows the text that will appear in browsers that have image loading turned off or which cannot display images. Note I have centered the image. Don't forget the nesting of commands

```
<center></center>
```

The last thing you need to know about is tables.

The opening and closing tags are `<table> </table>`. Without modification, you will get a table with a solid background. The boldness of the table design comes in strengths from 1 to 10.

This table has a border of 1

This table has a border of 10

to define the border and to define the width of the table on a page, the opening tag is modified:

```
<table border="10" width="75%">
```

Each row of a table is defined with the `<TR>` `</TR>` pair of tags.

Cells within the row are defined by the `<TD>` `</TD>` tags, for 'table data'.

Cell 1	Cell 2	Cell 3
Row 2	Column 2	Text

The HTML for the table above is:

```
<table Border="1" width =75%>
  <tr>
    <td>Cell 1 </td>
    <td>Cell 2 </td>
    <td>Cell 3</td>
  </tr>
  <tr>
    <td>Row 2</td>
    <td>Column 2</td>
    <td>Text</td>
  </tr>
</table>
```

A useful device for containing text on a page is to use a table with two columns and no border. If you place your text in one column only, it will not fill the whole page. In this case the table border tag is set to zero:

```
<table border="0" width="75%">
```

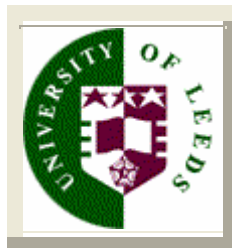
This is the effect that you can get:

The first group are viruses with **conventional properties**, mostly associated with an acute illness that, under the right conditions, can cause a chronic and protracted disease. An example is the association of the measles virus with progressive CNS disease, subacute sclerosing panencephalitis, (SSPE). The SSPE agent is clearly not the wild-type measles virus but, rather, is most likely a mutant, defective or recombinant form of the virus. Other examples include Progressive Rubella Panencephalitis (PRP) associated with the rubella virus and Progressive Multifocal Leukoencephalopathy (PML) associated with the polyomavirus JC.

Its HTML is as follows

```
<center>
<table border="0" width=75%>
  <tr>
    <td>
      The first group are viruses with <b>conventional properties</b>, mostly associated with
      an acute illness that, under the right conditions, can cause a chronic and protracted
      disease. An example is the association of the measles virus with progressive CNS disease,
      subacute sclerosing panencephalitis, (SSPE). The SSPE agent is clearly not the wild-type
      measles virus but, rather, is most likely a mutant, defective or recombinant form of the
      virus. Other examples include Progressive Rubella Panencephalitis (PRP) associated with
      the rubella virus and Progressive Multifocal Leukoencephalopathy (PML) associated with
      the polyomavirus JC.
    </td>
  </tr>
</table>
</center>
```

You can put pictures in tables...



Try to work out the HTML for yourself.

The following question will take you back up the page to illustrate the use of 'anchors'.

Do you want to go back?

With this information, you can now create your own web pages in a simple text editor such as 'Notepad'. I have not given away all my tricks, you can view these using the "View Source" facility of your browser.

Good luck with the assessment.

Page updated March 2004

