



Linking Teaching with Research in the Disciplines

Case studies for Courses and Course teams

The use of poster presentations as a teaching tool providing opportunities for student centred learning and developing science communication skills

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Classification Category

- Using assignments which involve elements of research processes (e.g. literature reviews, bidding for grants, drafting bids or project outlines, analysing existing project data, presenting at a 'conference').
- Bringing data/findings from staff research/consultancy into the curriculum.

Context

- **Course title: BSc Food Technology**
- **Level: level1, 2, 3**

Background and rationale

The use of poster displays is an essential tool for communication within both academic and commercial environments. In particular the effective design of posters is important for the delivery of both scientific and commercial information. In many respects, the presentation of this information can be regarded as being more important than the actual results, especially if the poster is being used as a tool for commercial exploitation of those results. Poster displays are ideal vehicles to develop communication skills, but also, the skill of critical appraisal when optimum characteristics are required for clear communication and visual impact in the students work. Because the displays are shared by a wide audience (group and others), students could be subject to peer evaluation. Thus, engaging students in poster display activities encourages them to develop valuable transferable skills.

Traditionally students have been involved in the preparation of static poster displays involving writing, printing and cutting and pasting text, tables and figures. However with the greater emphasis being placed on information technology (IT) and the use of software, the resulting posters are potentially more versatile and can be designed more professionally at a lower cost.

Within BSc Food programmes there has been an element of module assessment through traditional poster displays, demonstrating skills of information retrieval, appraisal and communication, either by students as individuals or as part of a group. Recent developments in student centred learning and the embedding of IT within the curricula has led to the design of a 'virtual' poster display. These virtual posters can then be displayed on either a computer, shared on the module portal on the universities web-space, or printed and delivered as a traditional poster. This allows students to experiment more freely with different forms of poster conformation, encouraging creativity by designing their own poster, verify communication effectiveness by checking against given standards and guidelines and also aids their information retrieval by direction to subject specific information sites on the Internet. Additionally, the actual cost of developing the virtual poster (in terms of graphic aids) is minimised, and the flexibility of the communication medium allows for easy alteration and improvements.

Students are directed to specific information, including software tutorials, details on required content, poster design guidelines and/or templates. This information is made available to students on the Intranet and freely accessible to them both on and off campus. In one format for the assessment, a range of pro-forma poster designs are made available for evaluation and discussion amongst staff and students during a session. These example posters tend to be ones which the staff have previously used during conference presentations. This stage is vital in encouraging dialogue between peer groups and assessors about presentation styles, the amount of information required to educate the reader and generally about the effectiveness of the posters. In occasions, posters from previous years could be used to show a range of good and bad quality posters. The students could discuss in groups and build a list of 'good ideas' and another of 'things to avoid'.

Historically this resource has been directed to third year students, however feedback from staff, students and external examiners suggested that although Stage 1 and 2 students developed limited IT skills through the generic computing modules, some the students were unaware of the application of different styles and uses of poster displays in an academic context and in further commercial applications.

This would encourage a wider use of information resources through students using existing databases, support material and reference literature. Additionally it would encourage students to critically evaluate information for dissemination by poster displays as well as facilitating peer- peer interaction and group evaluation.

The Traditional way

1. Staff placed a range of poster examples in displays. Additionally students were directed to departmental posters (previously used by staff at international conferences) which were on display on the Faculty premises. Also, A4 printouts from previous years posters were available for inspection.
2. Themes: Posters are versatile, in some stage 3 groups, the theme of the poster is an individual report from a group practical activity (experiment) in the laboratory. Stage 1 students in a Food Programme were asked to study specified products in the marketplace (for instance the role of texture in food quality, or factors which affect consumer choice of foods) and produce an informative poster in small groups.
3. Specific guidelines as to the content of the poster were given to the students generally following styles and layout adopted by conference organisers (i.e sections include Title, Name of presenter, Abstract, Introduction, Methods, Results, Discussion / Conclusion and References). Use of embedded figures and pictures was encouraged.
4. Staff provided additional information, using handouts and booklets, and suggested informative website and databases.
5. Assessment was carried out by staff and students with the aid of an structured assessment form (See Example Poster Assessment form).
6. Follow up workshops were used to disseminate good practice to students and to evaluate student perception of such processes.

The On-line Method

1. Students were required to design their posters Posters using preferably specialised presentation software (power point), although some students prefer to use a word processor.
2. Guidelines and resources were available on-line. Example posters were made available on the student intranet or website.
3. Submission was on-line (a variant of this activity is to include anonymous peer assessment, in which case submission was by e-mail to the instructor, and the poster were given a code and verified that they were otherwise unidentifiable)
4. A 'virtual' poster display took place on the intranet student portal or website
5. Each student was required to mark 3 of their peers posters (coded- if anonymous) following an assessment protocol (questionnaire). Then they would also mark their own poster and submit their marks and feedback.
6. A formula was applied to compute the marks and feedback was made available to the authors.

A variant of this method incorporates the calibration of the assessors, in which case, they are make to mark 3 posters of low, medium and high quality. Marks are means-weighted according to the proficiency of the marker. This method was applied on-line by the use of the 'Calibrated peer review (CPR)' system (<http://cpr.molsci.ucla.edu>).

Hot tips and things to look out for

The actual process is fairly self-sufficient however there are a few things which help with the smooth running of the activity:-

- Provide a varied selection of successful posters for the students to evaluate, these should include examples of use of graphs, text and pictures
 - If possible, provide examples of both good and bad posters for student assessment prior to the exercise to facilitate dialogue between students on judging the quality of posters
 - Ensure adequate computing resources are available to students during preparation and presentation
 - Discuss, and agree, with the students the elements of the poster which are going to be assessed so that the whole assessment process is transparent
 - Be prepared to go back to basics with regards illustrating to students how to embed objects into computer programmes and similar IT problems
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Does it work?

Impact on students:

Generally students received the exercise very well and enjoyed the practical application of IT knowledge. Indeed the use of these virtual poster presentations has a true economic benefit on students by reducing expenditure on paper, poster boards and poster preparation tools. This benefit cannot be ignored in relation to the financial hardships many of our students experience during their education. While all the students welcome the group discussion of the poster requirements, some students were sceptical in regards to peer assessment. The concept was certainly new for some of them and were uncomfortable about personal issues within the group.

The overall impact on students can be summarised as:-

- Students are encouraged to access a wide range of information sources through existing databases, support material and reference literature
- Students skills of critical appraisal and dissemination of information are enhanced particularly via a non-traditional information medium
- Students are encouraged because of the flexibility of virtual poster displays; to evaluate information critically and disseminate it by creative means thus improving motivation through student centred learning.
- Through working in groups students facilitate their own interpersonal skills, particularly where the teaching modules are accessed by students who are unfamiliar with each other.
- Once students were reassured about the mechanics of the peer assessment and offer the anonymous identity of the poster, they seem to understand the relevance of peer review
- Extra support to students with lower IT skill is needed to reduce frustration and facilitate achievement.
- The more IT literate students inform and facilitate the learning of less confident students

Impact on staff:

The use posters has also had a positive effect on staff as an alternative to more conventional assessment methods. Peer review is effective with a great number of students. A well structured assessment system is necessary for the students to evaluate their peers, which is an opportunity to focus on skills being developed. For virtual posters, another use of computer tools aimed at facilitating learning was developed. In particular, staff have been made more aware of the potential use of presentation software (PowerPoint) in designing and presenting lecture classes and also in providing lecture notes. The flexibility of such a system also enable the staff to place such material on student / module intranet so as to easily share information. Thus the benefits to staff can be summarised as:-

- A welcome change from traditional assessment methods, peer assessment reduces the burden of adequate and intensive feedback on the staff by distributing the task among the students.
- Information made available via the Intra and Internet is made available to a wide population of students
- Staff are able to direct students to information web sites to facilitate information retrieval.
- Through feedback from the students, staff can determine measures that will improve the support to students in information retrieval, appraisal and display

What problems/issues have arisen?

Surprisingly one of the major problems arising from this exercise was the discovery that many 1st year students, despite having learnt in a computer environment, have a general lack of knowledge with regards to PowerPoint and image processing software.

There is also a general reluctance from mature students, who may be less computer literate or have had less exposure to computers, to use computers to develop their posters and participate in the on-

line exercise. Although this is a sweeping generalisation, mature (part-time) students were more likely to find this problem.

Compounding this is the possible inequalities of IT skills amongst students. Although many students had access to computers at home, it can not be assumed that all students do have this access. As such, although the exercise has a potential to offer greater learning flexibilities to some students, others may be restricted by access to university equipment. This can have an effect on maintaining student resistance to use a novel approach to a traditional information medium.

Further developments

Poster presentations could be used to develop a variety of skills. Personal communication, public speaking, problem solving and negotiating skills could be peer-evaluated by face-to-face presentation.

The embedding of on-line presentations into student learning has much potential. One area in which we have expanded this and will continue to expand on, is the encouragement of students to present results from case study assignments as on-line presentations (PowerPoint lectures) with supporting handouts. This normally takes the format of mini-conference style presentations. Each individual presentation lasting between 10-15 minutes, and peer assessed with regards to relevance to initial objectives. Such presentations have proved very useful in detailing results from industrial problem solving case studies where practitioners from the food industry have also been present to assess and advise students. This has developed a stronger link between the food industry and the students.
