Evaluating Learning Technology Resources

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Introduction

Evaluation of learning in Higher Education has become increasingly important in the last few years in conjunction with the development of learning resources that use new technologies. This is partly because of a co-incidental cultural change towards demonstration of effectiveness and cost-effectiveness in the sector, but also because technology resources involve high levels of investment that need to be justified. Evaluation is also useful for investigating and exploring the different and innovative ways in which technologies are being used to support learning and teaching.

This guide gives a brief overview of the key issues involved in evaluating learning technology resources. As the subject is much too big to cover in detail, this document draws on and refers to some of the high quality publications available in this area.

Evaluation is essentially a process of asking pertinent and incisive questions. The following is intended to give a brief introduction to help you decide what questions to ask, how to ask them, and what to do with the answers.

How can evaluation of learning technologies support teaching and learning?Effective evaluation can help to ensure that learning technologies are developed and adopted in ways that support learners, teachers and institutions to realise their aims. The following are some scenarios where evaluation can be useful:

1. For academic staff who are considering using learning technologies to help support their teaching, evaluation can help to assess which technologies would be most appropriate and how they can best be integrated into their practice.

2. For staff who are thinking about acquiring a particular technology-based learning resource, evaluation can ensure it will be suitable and cost effective to use with students.

3. For academic or support staff who are in the process of developing their own technology-based resource, evaluation can inform ongoing development and thus ensure that the resource will meet the learning needs of its intended users.

4. For developers of technology-based learning resources, evaluation demonstrates that the resource is useful and achieves its stated aims, thus helping to "sell" the resource to potential users and to justify funding.

For academic or support staff who have decided or are required to use a particular resource, evaluation can help to identify the best way(s) of embedding it into their teaching.

Planning your evaluationIdentify your aim

The very first step is to identify clearly the purpose of creating or acquiring the resource that you are evaluating. This will help to identify the aim of the evaluation, as this will often be to assess whether the purpose of the resource is realised, and it will also help to keep these distinct from each other. The scenarios in the previous section all include examples of evaluation aims. It is a good idea to write down your aim in a single, carefully worded sentence.

Looking back at the previous section, let's say, for example, that the resource in scenario 2 is a commercially produced, computer-based tutorial. Your purpose in buying the resource could be "to provide students with opportunities for extended practice in the subject". The overall evaluation aim could then be something like "to establish whether this resource would be an effective way of providing students with opportunities for extended practice in the subject".

Identify what type of evaluation you are doing
Next it will be helpful to consider what kind of evaluation you are carrying out. There are several types of evaluation, which will reflect the overall aim:

- **Needs analysis** – An assessment of the current situation and how the resource in question may help.
- **Formative Evaluation** – This involves collecting information about a prototype resource in order to improve usability and refine content etc.
- **Summative Evaluation** – This takes place at the end of the developmental cycle, in order to demonstrate the effectiveness of the resulting resource.
- **Integrative Evaluation** – looks at how the resource can best be integrated with all the other resources that are available to its users.

Identify your stakeholders and their concerns
The emphasis of an evaluation will also very much depend on who it is being carried out for. Which of the different groups of people who will be affected by the resource will you consider, and what will each one most want to know about it? The following lists some of the key stakeholders who might be of relevance for the scenario outlined here.

- **Students** – may mainly be interested in how easy and enjoyable it is to use, and whether it will help them get through the exam
- **Lecturers** – will perhaps be mostly interested in whether any content is of high quality, and whether it fits into the course
- **Developers –** will need to consider whether any changes required are feasible and how long they will take, as well as discovering any bugs in the program
- **Support staff –** will need to consider what the hardware implications of the resource will be, or for example whether it might cause any disruptions to the network
- **Managers** – will want to know whether the resource fits into the institutional strategy and whether it can enhance the status and attractiveness of the institution.

Consider your budget

Evaluation can be time-consuming and expensive. It is therefore important when planning to consider how much can realistically be done within the available budget, and if necessary, pare down to the essential questions. Key factors in determining the time and costs of evaluations is the kind of instruments that are used to collect the data and the methods used to analyse the data. The Learning Technology Dissemination Initiative's Evaluation Cookbook (Harvey 1998) guides the user through the process of deciding how to scope the evaluation, and contains a table that analyses resource implications of a wide range of evaluation instruments.

Choose your evaluation questions

The next step will be to take your overarching question and break it down into more detailed questions, ensuring that they also address the concerns of your various stakeholders.

So in the example given for scenario 2 above, the overarching question could be:
"Is this resource an effective way of giving students further practice in this subject?"

More detailed questions could include:

- Does this resource fulfil a real need?
- Do users learn from this resource?
- Do users like using the resource?
- Given a choice, do users make use of the resource?
- How easy is it to use?
- Is the content of high quality?
- How does the resource compare with other ways of approaching the same material?
- What hardware is required and is this available to the intended users?
- Do the intended users have the necessary level of computer skills?
- What are the costs of buying and running this resource?

There are a number of evaluation guides available that contain lengthy lists of evaluation questions that can be useful (see below).

Carrying out your evaluationEvaluation InstrumentsHaving decided the 'what' of your evaluation, the next step will be to decide on the how. It is important to use more than one instrument in order to triangulate and cross check results, and to choose instruments that are suitable for the questions you are asking. The following describes some of the most popular methods and their uses:

Interviews - Good for gathering in-depth data from small numbers of people. It is best used to solicit opinion rather than fact, or for identifying issues which can later be measured in larger numbers with a questionnaire.

Focus groups - A "moderated meeting of 'involved' people discussing their experience of an educational intervention" (Harvey 1998). They can elicit a wider range of views than individual interviews. Form groups from people of similar status.

Questionnaires - Excellent for canvassing very large numbers of users or potential users and very time efficient. However, they are limited in the kind of data they can gather and are generally better for straightforward factual data than for opinions or descriptions.

A common problem is low response rates. To maximise response:
a) use clearly worded questions;
b) ask for quick and easy responses, such as ticking a box; and
c) use a clear and attractive layout.
A prize draw (cash, book tokens etc) may also help.
Some URLs for good questionnaire design are given below.

Observations - Evaluators observe users at work with the resource, often with a checklist to record users' responses to particular features. Observations can be useful for highlighting specific navigation issues, for finding anomalies in the content, or for assessing how learners' and teachers' behaviour is affected.

Think-alouds - Users are asked to describe their thought processes while using the resource. Users working in pairs or threes promote audible discussion of issues that come up as they are working.

System log data - Step-by-step recording of user interaction with a particular resource. Enables tracking of user preferences and navigational choices. Web servers keep logs of this data, and

software is available to analyse it. However web logs are very unreliable and provide only a general guide.

Textual data - Analysis of text resulting from learning activities involving email, computer mediated conferencing, or chat. Good for assessing student participation and interaction, and the effect of teachers' interventions.

Cost analysis - To assess the costs of creating, implementing or using the resource, and for construction of a business case. Include factors such as authoring and administration time, technical support, hardware costs, programming etc.

Working with the resultsAnalysisHow you decide to analyse your results will depend to some extent on the kind of data you have collected; for example responses from a closed-question questionnaire will lend themselves to very different analysis to those from an unstructured interview. Oliver (1998) proposes that the main criteria for choosing methods of analysis should be how quick they are to use and how contextualised the results they provide will be.

Evaluation in the developmental cycle

In order to ensure that evaluation data is used effectively, it needs to be fed into the developmental process at regular points. This should be built into the planning process from the outset. Ways of doing this are by scheduling meetings of developers, managers and evaluators and through regular written reports.

Dissemination of the results

When you have completed your evaluation, the Learning Technology community will want to hear about your results. Dissemination through organisations such as ALT, via their annual conference (ALT-C), Journal (ALT-J) or Newsletter (ALT-N) will contribute to the development of good practice in the use of Learning Technology.

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