Improving Courseware Evaluation via the Use of a Model

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Abstract

To help overcome problems associated with courseware evaluation there are a growing number of support tools being developed, such as models, frameworks, handbooks, and toolkits. This paper presents an overview of a model designed to aid evaluators of courseware. The model evolved from a critical analysis of current and past courseware evaluation methodologies and a detailed examination of factors that may be influential, particularly learning theory and stakeholder interests and biases. The model is structured in three phases – Planning, Conducting and Reporting of Results - each incorporating a number of tools and resources designed to help evaluators consider and address critical issues and make appropriate decisions for their specific circumstances.

Introduction

With courseware being increasingly utilised in education and training, there is a need to be able to evaluate its quality and suitability. Courseware evaluation, however, is subject to a number of common problems that often limit its usefulness. These shortcomings include methodological problems, inappropriate choices of evaluation goals, questions, tools and methodologies, and not accounting for contextual factors. Courseware evaluation can also be adversely affected by the influence of stakeholders and failure to address learning issues. It is becoming increasingly evident that there is a need for courseware evaluators to consider ‘the big picture’.

Along with developments in evaluation methodologies, researchers have recently begun to develop support tools to improve courseware evaluation. These tools include models, frameworks, handbooks, and toolkits, which aim to promote good practice in courseware evaluation by encouraging evaluators to consider a range of issues. They are also designed to allow novices at conducting evaluation to make informed decisions by providing critical information.

This paper proposes a model that aims to help courseware evaluators produce useful and accurate evaluations, by minimising the likelihood of encountering the problems listed above. The model consists of a number of components to help evaluators tailor-design evaluations, encourage the examination of important, and often neglected, issues. As such, it is more comprehensive than many of the other support tools available, whilst still aiming to be easy to use for the wide range of people who may wish to conduct courseware evaluation, including teachers and software developers.

Structure and Use of the Model

The model is presented in three phases – Planning, Conducting and Reporting of Results. The planning phase covers the design of the evaluation from the formation of the initial evaluation questions to the drawing up of the evaluation plan. The conducting phase covers the time of the actual implementation of the evaluation and any ongoing modification during this time, while the reporting phase covers the final analysis, interpretation of data and the dissemination of results. Each phase incorporates a number of components to assist evaluators in clarifying the issues relevant to the specific phase and to help them make appropriate choices, thereby maximising the efficacy of their courseware evaluations.

The model incorporates guidelines, information tables and a set of evaluation categories, all of which aim to clarify issues for evaluators. Critical issues addressed by the model include stakeholder consultation and involvement; selection of appropriate evaluation goals, questions, tools and methodologies; consideration of learning theory and pedagogic design; and identification and reduction of biases.

There are two kinds of components used in the model – tools and resources. Resources offer reference information, such as guidelines or descriptions of important aspects (e.g. methodologies, biases), while tools are designed to be actively applied by the model user (often in questionnaire or checklist format). Many of the resources support the tools by providing supporting and clarifying information that the model user can refer to when using the tools (e.g. descriptions of methodologies, information on incorporating stakeholders, lists of potential biases). By consulting and working through these model components, appropriate and informed decisions can be made in each of the three evaluation phases.

The planning phase of the model is the most complex, as a principal goal of this phase is to aid selection of the
most appropriate methodology or methodologies. Owing to the importance of this decision, and the number of potentially influential factors, this phase contains the largest number of components. The components of the conducting phase of the model emphasise reviewing of the data gathering process, ensuring that evaluation goals are being met, and modification of the evaluation if problems are identified. Finally, the reporting phase’s components emphasise reduction of bias in the analysis and reporting of the results and propose ways of ensuring appropriate dissemination of results. Table 1 outlines the principal aims of each of the three phases:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Aims</th>
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<tbody>
<tr>
<td>Planning</td>
<td>Provide information on stakeholder involvement in the evaluation design and assist in this decision. Assist in establishing evaluation goals and framing evaluation questions. Assist in the assessment of learning-related issues. Provide information on possible evaluation methodologies and techniques and assist in appropriate choices. Minimise bias in this phase. Assist in the drawing up of the evaluation plan. Provide a checking mechanism to review the evaluation plan.</td>
</tr>
<tr>
<td>Conducting</td>
<td>Provide information on stakeholder involvement in the evaluation conduct and assist in this decision. Minimise bias in this phase. Provide a checking mechanism to ensure the evaluation is meeting evaluation needs and advise on how to modify the evaluation if it is not. Encourage suitable documentation of this phase.</td>
</tr>
<tr>
<td>Reporting</td>
<td>Provide information on stakeholder involvement in the analysis of the evaluation data and in the reporting of the results and assist in this decision. Minimise bias in the analysis, interpretation, and reporting of the evaluation results. Assist in determining how to best distribute the evaluation results. Provide a checking mechanism to review the evaluation results.</td>
</tr>
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Table 1: Principal Aims of the Model Phases

Aiding the phase-specific components of the model are two general components that have applications for the entire evaluation process. These components are resources that can be consulted for information when using other model components. Specifically, the general components offer information on stakeholder involvement and bias identification and reduction. These issues are critical because stakeholders, whether evaluators, participants or consumers, may consciously or inadvertently affect evaluations [4]. This influence can occur in all three phases of an evaluation as defined in the model. Bias can likewise affect each of the three evaluation phases.

The model will be available as both a hard copy and a hyper-linked HTML version. The HTML version allows users to jump between associated components (e.g. resources and tools) and takes users to subsequent components based on their needs (as indicated by certain responses). The HTML version also indicates where users may need to revisit components (e.g., if bias is indicated, earlier decisions may need to be altered).

Conclusion

The model emphasises the presentation of a holistic picture, not only of the courseware and its use, but also of the evaluation itself. The model is also flexible to allow for the wide range of evaluation needs and courseware designs and aims that exist, hence it allows for the use of a range of methodologies and data collection procedures. The actual methodologies used will depend upon the conclusions drawn as a result of applying the model. In addition, the questionnaires, checklists, points for consideration, suggestions and recommendations offered in the model will aid in the addressing of common problems associated with the evaluation of courseware. It should be noted that, although individual phases and components of the model can be consulted to address individual concerns, it is recommended that for optimum outcomes most, if not all, of the phases and components should be utilised.

References