# A FLEXIBLE STRATEGY FOR EVALUATING SUBJECTS

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#### ABSTRACT

This paper presents a process for evaluating subjects to determine whether the structure and design is appropriate for student learning. Evaluation is important in determining what aspects of the program and/or subject require improvement. The evaluation of any subject must be planned for at the design/redesign stage. Further, it needs to be conducted across the entire subject. The primary purposes for the evaluation are to determine how well the students are learning and how that learning process can be improved. The evaluation process described in this paper identified several changes to the subject that would enhance student-learning outcomes.

#### **INTRODUCTION**

Quality has become a high priority item for most Universities, particularly with respect to teaching and learning. Universities have varying ways of determining whether the material presented to students is of sufficient quality. Quality becomes an even more important issue when Internet technologies are used to increase the level of flexibility, that is, the range of choices available to students. This paper presents a process for evaluating a subject to determine whether its structure and design enhances student leaning outcomes. The first section provides a summary of the relevant research literature. The evaluation process is discussed in the second section. The third section describes an application of the evaluation process, while the final section provides a discussion of the outcomes.

## **OVERVIEW OF THE LITERATURE**

The importance of evaluation has been widely researched over the years. Evaluation is important in determining what aspects of the program and/or subject require improvement. A persuasive argument for undertaking evaluation is that change is a desired process in learning and, consequently, evaluating a subject is the best way of determining ways to improve on that change process. Reeves [5], provides support for this view as he believes that education requires change, deep change in the learner; thereby making evaluation important for appreciating how improvements can be incorporated into the subject design and implementation. Rowntree [4], in defining evaluation, makes three pertinent points: Evaluation is not a synonym of assessment; it is concerned with what happens and not just what was meant to happen; and it must be planned, systematic and discussed openly by all involved. Several reasons for undertaking an evaluation and who may be interested in it and its outcome are identified. While information can be collected on a range of things, Rowntree warns educators to be selective about what data is collected and remember that the primary purpose of an evaluation is to improve the subject or program through changes to design, teaching and learning activities, assessment strategies and so on.

Draper [2] identifies four types of evaluation used to assess teaching/learning materials and resources: formative, summative, illuminative and integrative. Several simple approaches to evaluation are overviewed in the paper including the checklist approach; what participants feel, by addressing the whole situation; and using an experiment. One comprehensive approach discussed was Laurillard's evaluation programme, which encompasses design, development and implementation. While Draper provokes thought on the importance of evaluation, his research is a starting point for planning an effective evaluation strategy. Rowntree [4] presents data collection techniques, such as review of documentation; review of assessment results; questionnaires and

learning logs. He recommends that evaluation should be planned for during the design phase of the subject and conducted throughout the duration of the subject. Once the data has been collected, it must be analysed and the results interpreted. Gibbs [3] discusses sources of evidence that can be used for evaluation purposes including observations and reflective diaries; student feedback questionnaires; focus groups and interviews and student logs. Gibbs considers that assessment data and student learning outcomes can contribute to evaluating the effectiveness of a subject. He argues that average marks and the distribution of the marks can provide supporting information but should not be used in isolation. Results must be interpreted carefully because several explanations, both negative and positive, can be offered. Learning outcomes and performance can be combined in an evaluation to provide meaning to the marks.

Draper [2] discusses the main issues associated with opinion, memory and observation. He points out that while student evaluation questionnaires have become standard practice, they are retrospective and rely on memory. Consequently, they are less effective than on-the-spot observations. Further, Draper regards expert opinions to be less trustworthy than the teacher's since teachers have worked with the students. However, the teacher's opinion is less valuable than that of the learner, whose opinion is less valuable than behavioural tests. While, costs and resources may drive the choice of evaluation method, it is better to use a representative sample of learners, test what they have learned and observe them while they are learning. Bain [1] highlights problems in the research on evaluations. He points out that many project designs did not pay enough "*attention to the learning processes and outcomes involved; and the evaluations did not provide meaningful evidence of student learning outcomes, most relying on feedback from students, peers and experts"* [1, p. 165]. He presents an integrated evaluation framework [1, pp. 168-169] that can accommodate innovation in education in all its various forms.

## **EVALUATION PROCESS**

The literature deals with several issues or themes that range from the defining and identifying the purpose of the evaluation to the different data collection methods and their associated problems. The themes can be considered as a series of questions; the answers to which would be specific to individual subjects. The details of each theme/question are provided below.

<u>Why Evaluate</u>? Rowntree [4] considers that evaluation is not a synonym of assessment; rather it is concerned with what happens and not just what was meant to happen. In addition, it must be preplanned and systematic. Further, Rowntree states that evaluation can be undertaken for several reasons, which he grouped into three broad categories, namely, political, managerial and educational reasons.

• <u>Political reasons</u>: 1) Because it is expected by University/Department; 2) Settle the doubts of others; 3) Disarm opposition; 4) Obtain supporting evidence in case of criticism; 5) Obtain additional resources; 6) Justify expenses; 7) Help in marketing the programme; and so on.

• <u>Managerial reasons</u>: 1) Demonstrate acceptable outcomes; 2) Detect any problems that may arise; 3) Monitor staff performance and so on.

• <u>Educational reasons</u>: 1) Assist in developing staff (reflection and review), 2) Help in team building; and 3) Improve the teaching and learning process.

While these reasons are relevant, the primary purposes for evaluation should be to determine how well the students are learning and how that learning process can be improved.

<u>Who is the evaluation for</u>? Rowntree [4] considers for whom the evaluation is undertaken. This requires identifying the stakeholders and their desires. Stakeholders can include:

<u>Students</u>: Students want to be able to learn effectively; Have clear guidance on Teaching and Learning activities and assessment tasks; and Assessment tasks that are relevant to their workplace;

<u>Teaching Team</u>: Quality product; Expertise to learn from, Innovation in design; Avoid repeating the same mistakes; Working as a team;

<u>Colleagues</u>: Expertise to learn from; Innovation in design; Avoiding the same problems; Support and mentoring;

<u>School/Department</u>: Assurance of Quality; Staff performance review; Staff development;

<u>University</u>: Assurance of quality of project; Meeting (and Exceeding) Quality Requirements (Quality Audit); Resources are spent according to budget;

Industry and Employer groups: Assurance as to relevant content; employability of graduates.

Responses to these desires could be obtained through formative and summative evaluation throughout the design and implementation process.

The evaluation process would entail the collection and consideration of materials from members of the major stakeholder groups for the assessment of performance and the generation of development plans for the coming year. Ideally, all stakeholder groups should have input. It is however, operationally feasible to only include feedback from students, peers and the staff member's academic supervisor with respect to an individual subject.

<u>What is to be evaluated</u>? Determining what is to be evaluated will depend on the reason for the evaluation and who the stakeholders are.

**When will evaluation occur?** Evaluations should be conducted during the semester and at the end of the semester.

- Evaluations conducted throughout the semester are formative in nature and require the collection of data so as to change the subject while it is in progress.
- Evaluations conducted near or at the end of semester are summative and are used to sum up after the subject has been completed

Ongoing evaluations are important so participants can recognise the worth and value of their feedback.

**How will the data be collected?** Selecting the data collection technique(s) to be used will depend on the evaluation's purpose and form. Convenors can choose to use paper-based and/or Web-based evaluations. Many techniques are available (for example see [3] [4]). These include but are not limited to the following:

- Assessment Data (individual items linked to learning outcomes)
- Questionnaires (using Likert type scale with no mid point, open-ended and other question forms)
- Interviews (semi-structured or structured)
- Focus groups (larger groups such as tutorials and workshops, and smaller groups)
- Observations (by teaching team or external persons)
- External Reviewers (eg Industry representatives, employers)
- Peer Reviews (Colleagues and Part-time Tutors)
- Pre-tests and Post-tests (must have appropriate internal and external validity
- Learning checklists (completed by students)
- Student Profiles (to gauge student experience and attitudes; provide a baseline for future reference)
- Student Learning Logs (completed by students and reviewed by teaching team)

• Confidence Logs (completed by students to indicate their confidence on particular area, topic, or resources but do not provide any concrete evidence of learning)

• Review of subject documentation (Subject Outline, Study Guide, Lecture Notes, Assessment, etc).

The selection of evaluation technique(s) must be driven by the purpose of the evaluation, that is, what is being evaluated, and why. Each technique has its advantages and disadvantages, and these must be considered in the selection decision.

**In Summary:** These questions form the basis of the process used in the subject evaluation. An application of this process is described in the following section.

# **EVALUATION PROCESS APPLICATION**

An evaluation, using the process identified in the previous section, of a second-year e-commerce subject is described. The evaluation strategy was formulated from the outset of the subject design process.

<u>Why Evaluate</u>? The primary purpose of this subject evaluation is Educational, that is, to determine how well the students are learning and how that learning process can be improved. A secondary purpose has a managerial focus in that it will be used by the Head of School to demonstrate acceptable outcomes and assess whether academic staff members need to undertake skills development. The subject's learning objectives or outcomes follow. On completing the subject, students will have:

• A thorough grounding in e-commerce, the Internet and new technologies important to e-commerce;

• Attained knowledge of rapid changes taking place in e-commerce as well as any contemporary issues;

• Knowledge of the legal and ethical issues associated with using the Internet to conduct business;

• Knowledge of the stakeholders in electronic commerce and their capabilities and limitations in the strategic convergence of technology and business;

• Developed a basic presence on the WWW and an understanding the Web as a business channel.

The evaluation will be undertaken with due consideration being given to these learning outcomes.

<u>Who is the evaluation for</u>? The primary stakeholders are the subject convenor and/or teaching team and the students. The progressive evaluations are to be formative in nature: their purpose being to improve the subject and learning outcomes as well as self-development of teaching team. These formative evaluations were not used for other purposes.

<u>What is to be evaluated</u>? The subject convenor decided on the form and frequency the evaluations were to take. Subject content, teaching strategies, learning outcomes and learning resources were all evaluated. These evaluations were considered formative in nature. The distribution of assessment data was also reviewed (summative) and student opinions on the Concept Tests were sought (formative). An independent formal evaluation of the subject was also undertaken. This evaluation was designed to be summative so Management could determine quality of the learning outcomes.

<u>When will evaluation occur</u>? Three distinct evaluations covering Subject content, Teaching strategies and Learning resources were taken at different points during the semester; typically the week after the Content Module was completed. The Concept Test evaluations were conducted the week after the test was taken. The formal evaluation of the subject was sought in the last week of semester.

**How will the data be collected?** Techniques that were used included: informal student feedback; questionnaires; student learning outcomes and review of subject documentation.

**In Summary:** The primary purposes for the evaluation were to determine how well the students were learning and how that learning process can be improved. The teaching team were the primary users of the evaluation, but it will also be made available to other interested parties including students, colleagues and academic supervisors. Formative and summative evaluations were employed. Formative evaluation of the learning process helps determine if the improvements are functional and useful to the students. Summative evaluation determines if the improvements are as intended. Once the data is collected and analysed, measures that respond to the feedback need to be implemented as soon as possible.

## **EVALUATION RESULTS**

The effectiveness of the subject was evaluated several ways. Informal feedback sessions were held with the students to identify areas that they believed were relevant, or not, as they pertained to their learning. Students were also asked to fill out surveys indicating their use of the learning resources

and opinions as to the effectiveness of the teaching strategies and learning resources available to them. To this end, a questionnaire for each module in the subject was completed a week after its conclusion. All module surveys were the same except for the content section. The evaluation strategy also required a review of the distribution of assessment data. Assessment in the subject consisted of three Concept Tests (60%) and a Group Project (40%). A graph displaying the distribution of overall results and the averages of student scores on all of the assessment items was reviewed as a means of determining whether the desired learning outcomes were achieved. Student opinions about the Concept Tests were sought via a questionnaire, which was administered the week following a Concept Tests.

The purpose of the research was to evaluate whether the learning outcomes were achieved. The most interesting result from the evaluation focused on the Seminar (Lecture) teaching strategy. Given that Module 3 spanned the longest time (five weeks), contained the major elements of the subject and only two seminars were presented, the result as reported is not unexpected. However, while Seminar (Lecture) ranking was reduced by one place from Module 1 and 2 to Module 3, the Seminar Notes remained the highest ranked learning resource. It is apparent that the students perceived the notes as being more effective for their learning. This is most likely due to the fact that students could return to the notes at any point during the semester to assist in their learning. The Workshop Class Discussions had a higher ranking at the end of Module 3. One interpretation of this result can be that students saw more relevance in Module 3 for their e-Commerce Project than in Modules 1 and 2. The one rank drop in the Workshop (Overall) was unexpected as the workshop was the primary teaching strategy chosen.

The higher ranking, from 5 to 2, for the Chapter Summaries is mostly likely due to the fact that students could focus on the important concepts, which were tested via the Concept Tests. Further, students most likely found the chapter summaries more effective for their learning than taking their own notes from the textbook (a ranking drop from 3 to 5). The Web site (overall) fell by two places. This outcome is most likely due to the fact that only two seminars were held in Module 3 and the majority of student's having chosen an e-marketing application as their e-Commerce Project. One unexpected result was that the review tools provided for the students as a self-assessment mechanism were consistently ranked the lowest across the modules. No definitive reason was apparent from the open-ended questions on the survey as to the reason for this outcome. One possible explanation is that students did not understand the relevance of these tools or simply did not know how they could help in their learning process.

The results provide some evidence that the students were satisfied with the Assessment strategies, the level of flexibility, amount of support provided to the students and Web-based learning resources in the subject. Evidence of satisfaction with the Assessment strategies is evident in Questions 1, 2 and 6. Questions 6 and 7 provide support for the level of flexibility offered in the subject. However, not all students (34%) were convinced that flexibility as discussed in relation to the Web site learning resource was desirable (Question 5). Recognition of students and their needs was apparent in the responses to Questions 3 and 8. The flexibility of the teaching team in being responsive to the students' learning needs was evident. Question 7 indicated the level of satisfaction with the online environment that included more than just basic information. The majority of the students regarded the Concept Tests and the e-Commerce Project as positive learning experiences (Questions 1, 2 and 4). The attendance record of the students for seminars and workshops (Questions 10 and 11) provides overall support for student satisfaction with the subject. All but two of the students completing the independent evaluation attended five or more of the Seminars while 76% attended eight or more of the Workshops.

The distribution of total marks and the means of the assessment items indicate that the learning outcomes were achieved. The Concept Tests were designed to test all but the last of the learning outcomes. The contention is supported as the mean scores are above the Credit level; the only students who actually failed this item were those who withdrew from the subject. The Group Project was designed to test all of the learning outcomes. Given that the average mark was just above a Pass (50%), achievement of the learning outcomes is not as clear as with the Concept Tests. It is apparent from the assignments that many students failed to grasp the applied nature of the Group Project and opted instead to regurgitate theory. Students sought answers in textbooks rather than applying the theory to the business problem to reach an appropriate solution. Several assessment criteria were also badly handled - Risk Analysis, Survival Strategies and Development & Implementation. The implications of this finding are that more emphasis could be placed on practical examples, which may form the basis of workshop exercises. Alternatively, the applied nature of the subject could be made more explicit in the wording of the case problem. Open-ended comments on the formal questionnaire indicated that students felt they did not receive enough advice on what was required. Many believed that an overview of what was being proposed should have been reviewed or even form part of the assessment strategy.

Based on the evaluation, some changes were implemented immediately. Students requested a clock be added to the Concept Test window following the first test. There were several readings recommended for students. They requested and were given advice on the importance of each article for their learning. As the subject was designed to take a practical rather than theoretical focus, students were required to gain skills in using an application package widely used in business. A restricted version was available for student use. Additional copies of the software were made available to meet student demand.

Several changes were subsequently made to the subject for its next offering. These changes included a restructuring of some of the materials for example; the coverage of two module topics was collapsed to one week from a week each. The number of additional readings was reduced significantly to maximum of one per week. The remaining readings were classified as 'Postgraduate Only', as the next offering of the subject would include Postgraduates. An additional assessment item, a case study (15%) will be introduced as a precursor to the Group Project. The Case Study and the Group Project will be connected to the same business problem. The Case Study is intended to provide feedback to the students on suggested solutions to the business case problem prior to Group Project being completed and submitted.

Several learning resources were well received by the students and consequently were kept for the next offering including: Use of Noticeboard; a Discussion forum for Questions about the Subject and General Feedback on Assessment Items; Feedback on individual basis (Concept Tests and Group Project). However, one element that students wanted to exclude was actually kept - Working in a group. The University considers group work to be an essential Graduate skill. Further, graduates are expected by the industry to have teamwork skills. Consequently, group work was continued.

#### IN CONCLUSION

This paper has developed a process for evaluating subjects, and applied it to an e-commerce subject. The evaluation process was formulated to determine whether an effective teaching and learning environment could be designed and implemented. For the evaluation process to be considered useful, its application in assessing the design of new subjects and the redesign of existing subjects must be tested. To this end, the process has been applied to a new e-commerce subject, which was designed for the flexible learning mode of delivery. The evaluation of the effectiveness of the teaching and learning environment resulted in positive support for the suggested evaluation process.