

## What do teachers want to know about their student's eLearning? A study of 70 evaluation plans

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### *Abstract*

*The e3Learning (enrich, extend, evaluate learning; e3L) project in Hong Kong has conducted 70 evaluations of web-assisted courses with teachers in three Hong Kong universities. In this paper the evaluation intentions of teachers are examined. What do teachers wish to learn when they evaluate their teaching? In each e3L sub-project a formal evaluation plan is produced with a range of evaluation questions. Our 70 evaluation plans contained 457 separate evaluation questions. These questions were examined in order to portray the range of Hong Kong university teachers' evaluation intentions and to see whether these changed during the 2½ years of the project. During the project there was a good balance of interest in looking across the learning environment, learning processes and learning outcomes, with increasing discrimination being shown in articulating what is meant by 'learning outcomes'. In addition, teachers became more interested in conducting needs analyses and in having formative as well as summative evaluations.*

### *Keywords*

*evaluation questions; evaluation focus; evaluation plan; evaluation trends*

### **Background: The e3Learning model of evaluation**

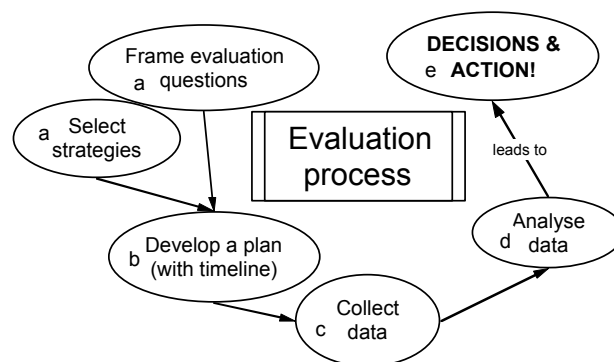
The e3Learning (enrich, extend, evaluate learning; e3L) project has been designed to assist teachers in web-assisted teaching and learning. It offers a range of design, development and evaluation services. For each sub-project or case, a team is formed whereby teachers have access to educational and technical support. Full details of the design of this project are in James et al. (2003) and the project website. The e3L project operates across three universities, the Hong Kong Polytechnic University, the City University of Hong Kong and The Chinese University of Hong Kong. The nature of the websites developed varies a great deal. A snapshot of the design features in our 70 cases is shown in Table 1. These are reasonably standard ways to conduct eLearning, including interactive design elements.

*Table 1: Design features of 70 e3Learning websites*

| <b>Interaction</b>                            | <b>Web-assisted function</b>                     | <b>No. of instances</b> |
|---|--|-------------------------|
| Low interactivity                             | Course background                                | 10                      |
|   | Notes/ PowerPoints                               | 17                      |
|   | Required readings                                | 8                       |
|   | Past papers                                      | 1                       |
|   | Project/ assignment archives                     | 1                       |
|   | Learning tools such as glossaries                | 1                       |
| Students interacting with materials and tasks | Learning resources/ links                        | 24                      |
|   | Multimedia materials                             | 22                      |
|   | Self-assessment                                  | 16                      |
|   | Grade-giving assessments                         | 4                       |
|   | Games  | 2                       |
| Interactions about specific information       | Teacher-student (one-on-one) communication       | 8                       |
|   | Assignment submission                            | 4                       |
| More public interaction space                 | Formal discussion forums with a range of designs | 28                      |
|   | Exhibition of assignments                        | 4                       |
|   | Creation and exhibition of multimedia projects   | 2                       |
|   | Inter-cultural discussions (across countries)    | 1                       |
|   |  | <b>Total 153</b>        |

The project has an evaluation officer (second author) who actively assists teachers with evaluating the websites developed under the auspices of the e3L project. The overall design of the evaluation is a reflection improvement model in which the findings of the evaluation contribute to further improvements in each of the web-assisted courses under investigation. There are evaluation resources already available, such as toolkits (eg. Oliver et al., 2002) or 'cookbooks' (eg. Learning Technology Dissemination Initiative, 1998) but we chose to use a process mediated by an evaluation officer in order to fairly rapidly build up a set of cases of good evaluation practice for Hong Kong university teachers to refer to. Our system (like all others) is not value-free and tends towards a naturalistic model (Guba & Lincoln, 1981; Alexander & Hedberg, 1994).

The process of evaluation consists of several stages, as shown in Figure 1. Although each of the e3Learning websites go through all the stages in this overall evaluation process, the exact evaluation design and schedule varies (Lam & McNaught, 2004). A customized evaluation plan is produced for each e3L website. (See [http://e3learning.edc.polyu.edu.hk/evaluate\\_scenarios2\\_plan.htm](http://e3learning.edc.polyu.edu.hk/evaluate_scenarios2_plan.htm) for a sample evaluation plan.) In this paper we are focussing just on the evaluation intentions of the teachers, as portrayed by the evaluation questions they decide to ask.



| Evaluation activities |   |
|-----------------------|---|
| a                     | <ul style="list-style-type: none"> <li>Meeting with teachers.</li> <li>Getting a clear picture of how the teacher wishes to use the web.</li> <li>Deciding on the evaluation questions.</li> <li>Deciding the types of data to collect and the instruments to use.</li> </ul>                                     |
| b                     | <ul style="list-style-type: none"> <li>Putting the decisions into an evaluation plan.</li> </ul>  |
| c                     | <ul style="list-style-type: none"> <li>The evaluation officer designs the various evaluation instruments needed.</li> <li>Teachers help to finalize the instruments.</li> <li>Teachers help to administer questionnaires or tests to the class.</li> <li>The evaluation officer collects the feedback.</li> </ul> |
| d                     | <ul style="list-style-type: none"> <li>The evaluation officer analyzes the feedback.</li> <li>The evaluation officer writes reports.</li> </ul>   |
| e                     | <ul style="list-style-type: none"> <li>Reports are handed over to the teachers.</li> <li>Meeting with teachers to look at the reports together and think about follow-up actions.</li> </ul>  |

Figure 1: The evaluation activities in the different stages of the e3L evaluation process

Evaluation questions vary in accordance with the design purposes for the elements of the website. The evaluation questions also vary according to the focus the evaluation has on the various stages of the learning experience. Figure 2 illustrates various aspects of students' learning experience (Bain, 1999). Evaluation can focus on one or more of these stages of the learning experience. For example, if we want to know whether students find a particular content-rich site valuable, there is a focus on the learning *environment* the students are experiencing. Evaluation questions such as the following might be appropriate. Is the navigation clear? Do the resources download easily? Are these resources appropriate for the desired learning outcomes? Is the number of resources about right? Etc. If we ask how often and when the students complete the online quizzes and exercises in an assessment-rich site, we are considering the learning *processes*. Lastly, if we ask whether students are able to demonstrate critical-thinking skills in some online debate activities held in the forum of a communication-rich site, or whether their performance on cognitively demanding tasks is satisfactory, the focus is on the learning *outcomes* that the students attain.

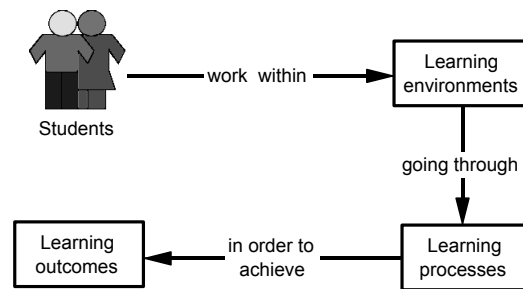


Figure 2: Stages of the learning experience

## Evaluation questions as a central component of evaluation plans

In the two-and-a-half-year period of the e3Learning project, 70 website evaluations were carried out. The evaluation plans were sequenced in time according to the date they were finalized (Table 2). There were, on average, six separate evaluation questions in each evaluation plan.

Table 2: Scale of the 70 evaluation plans

| Period   | Number of evaluations | Total no. of separate evaluation questions |
|--|-----------------------|--|
| 2 <sup>nd</sup> semester of 2002-03 – 0203(2)  | 7                     | 41   |
| 1 <sup>st</sup> semester of 2003-04 – 0304(1)  | 18                    | 110  |
| 2 <sup>nd</sup> semester of 2003-04 – 0304(2)  | 16                    | 111  |
| 1 <sup>st</sup> semester of 2004-05 – 0405(1)  | 18                    | 122  |
| 2 <sup>nd</sup> semester of 2004-05 – 0405(2)* | 11                    | 73   |
| <b>Totals</b>                                  | <b>70</b>             | <b>457</b>                                 |

- some cases in the 0405(2) are still ongoing and evaluations are expected to continue in 0506(1).

This paper is focused on comparing the evaluation questions contained in the evaluation plans of these 70 cases of the e3Learning project. While the evaluation questions were negotiated between teachers and e3L staff, e3L staff have taken care to ensure that the ownership of the design and evaluation processes is clearly with the teachers. To a large extent we therefore feel confident that the nature and range of the final evaluation questions in each plan reflect the evaluation intentions of the teacher(s) in each of the sub-projects.

The evaluation questions were extracted out of each evaluation plan. The questions were categorized by a process of first separating them into the four broad areas of:

- pre-development investigations; doing a needs analysis
- the learning environment; this could involve examination of actual materials and also broad cultural aspects of learning
- teaching and learning processes
- learning outcomes.

Then we further grouped the evaluation questions by a process of iterative sorting in order to preserve key elements in diversity while achieving a manageable way to look for trends across the 457 evaluation questions. Our final decisions resulted in 28 evaluation themes, which are shown in Table 3. The 'learning general' theme has a number of sub-categories.

Our analysis then examined the percentage of sub-projects or cases where particular categories of evaluation questions had been asked.

Table 3: Classification of the 457 evaluation questions

| Main evaluation themes                                |  | Description  |
|---|--|--|
| <b>Pre-development investigations/ needs analysis</b> |  |  |
| 1   | Evaluation of previous work                                    | Checking previous versions to collect ideas for the new development.   |
| 2   | Expectation  | Collecting ideas about what students need and wish to see on the website.  |
| 3   | IT skills/ habits of students                                  | Finding out the IT competence and habits of the students before teachers plan to introduce eLearning in their classes.                                 |
| <b>Learning environment</b>                           |  |  |
| 4   | Mid-development formative evaluation                           | Checking the web materials at the mid-stage of development.  |
| 5   | Strength/ weaknesses   | Finding out detail of the good and weak points of the web materials.   |
| 6   | Improvement ideas  | Being open to ways to improve the sites.   |
| 7   | Usability  | Collecting opinions on site design, layout and navigation.   |
| 8   | Opinions on content (difficulty/ coverage/ potential benefits) | Collecting opinions on the quality and quantity of the teaching and learning content on the site.  |
| 9   | Opinion on web teaching in general                             | Commenting on the eLearning experience as a whole, often contrasting this new way of learning with the traditional face-to-face only mode.             |
| 10  | Appreciation of effort   | Finding out whether students valued having eLearning experiences.  |
| <b>Teaching and learning processes</b>                |  |  |
| 11  | Class management   | Checking whether the site supported students managing their studies.   |
| 12  | Technical processes  | Looking at what hardware and software students prefer to use.  |
| 13  | Engagement   | Checking on the visits paid to the site and how students' spent time there.  |
| 14  | Patterns of use  | Concerning matters such as when students assess the site, what they do on the site, and how the eLearning experience affect other learning activities. |
| 15  | Meaningful/ effective communication                            | Concerning how students interact with the teachers or their peers online.  |
| 16  | Workload   | Finding out the amount of work involved in the eLearning activities.   |
| 17  | Enjoyment  | Finding out about students' enjoyment while completing the eLearning activities.   |
| <b>Learning outcome</b>                               |  |  |
| 18  | Motivation and affect  | Finding out whether the eLearning experience has resulted in higher motivation to learn the subject.   |
| 19  | Confidence   | Finding out whether the students feel more confidence in their studies.  |
| 20  | Approaches to learning/ learning styles                        | Finding out about a range of factors that can broadly be called a student-centred approach to learning.  |
| 21  | Generic learning skills  | Checking on whether generic learning skills (eg. communication and problem-solving) have been developed through the eLearning experience.              |
| 22  | Subject-specific skills  | Checking on whether subject-specific skills (eg. clinical or language skills) have been developed through the eLearning experience.                    |
| 23  | Thinking skills  | Checking on thinking skills such as the ability to evaluate or criticize.  |
| 24  | Reflective learning  | Finding out about students' ability to reflect on their own learning.  |
| 25  | Learning general   | Finding out whether the sites have helped learning of the subject in a broad sense   |
|   | remember/ understand   | Learning mainly in remembering or understanding of subject content.  |
|   | apply/ analyze   | Learning to apply theories and analyze various situations.   |
|   | evaluate/ create   | Learning how to evaluate a situation, build on concepts and construct artifacts.   |
| 26  | Retention of learning  | Checking the retention period of the knowledge acquired.   |
| 27  | Relationship/ sense of community                               | Finding out whether the eLearning experience has resulted in better relationships.   |
| 28  | Intercultural awareness  | Checking whether the online activities have promoted intercultural contacts.   |

## Trends and patterns in teachers' evaluation intentions

### *A balanced view of learning*

It is satisfying that there is consistent attention paid to the three aspects of learning (environment, processes and outcomes), as shown in Figure 3. Of course we present this as a model of learning but we do try not to foist our views on teachers. For us this affirms our beliefs that educational design input does assist teachers in developing more sophisticated views on learning and what they need to know about their students. For each case or sub-project in the e3L project there is an initial meeting between the teacher(s) teaching the course under consideration, the e3L project manager and the evaluation officer. Normally, one of the three e3L academic supervisors is also present. This is an excellent opportunity for teachers to articulate their needs and for the e3L staff to suggest ways in which these ideas might be enacted in a website. The conversation ranges across both educational and technical design ideas. This 'brainstorming' session is seen as a vital component of the e3L model. As the e3L project has progressed, we have had more examples of finished websites to show teachers in new sub-projects. These local examples really enrich these design meetings and have assisted a great deal in enabling teachers to take a wider perspective on learning.

### *Understanding the need to have data for planning*

Figure 3 also shows that teachers are now turning to pre-development investigations and are more seriously conducting needs analyses before embarking on design and development. Figure 4 shows the nature of these needs analyses. Mostly teachers are deciding to gauge students' expectations, though a few doing an analysis of students' skills. Only one teacher embarked on a focused evaluation of an existing site.

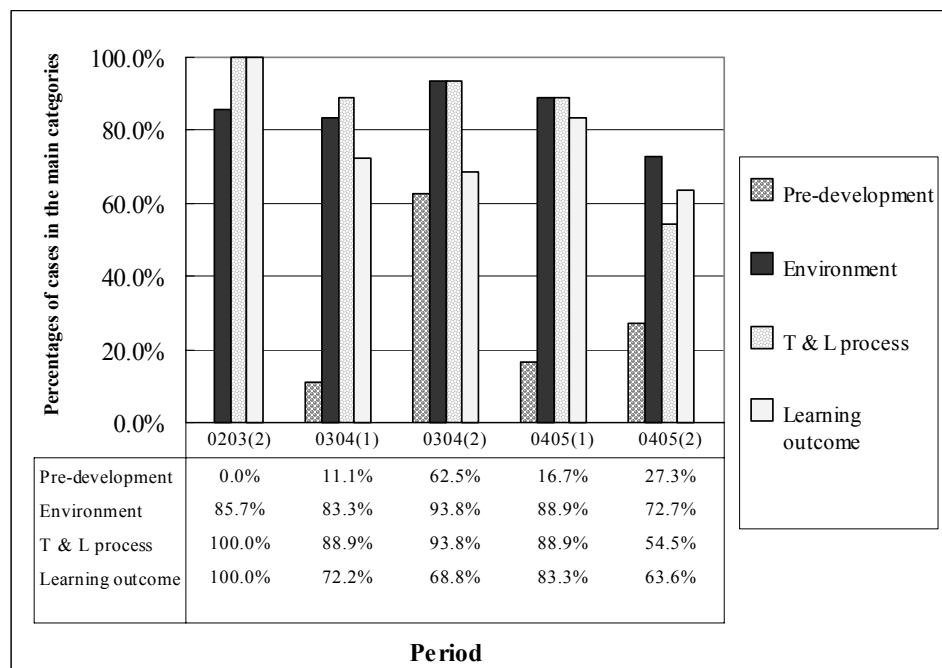


Figure 3: Balance of evaluations across the four major categories

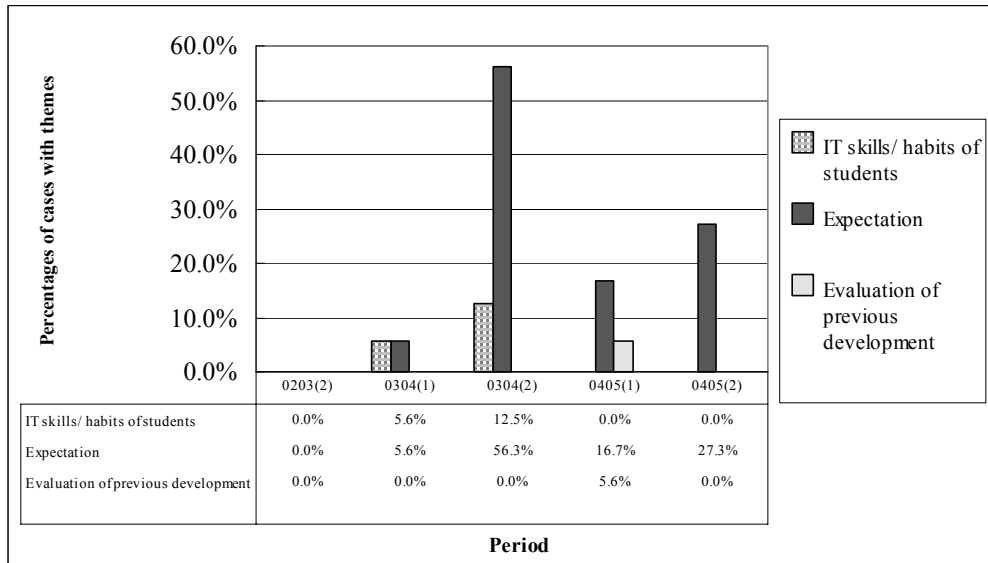


Figure 4: The nature of needs analyses undertaken

**From the general to the particular in evaluating the learning environment and processes**

Figure 5 shows that, at the beginning of the e3L project, teachers asked very general questions about the learning environment. Since then the evaluation questions have honed in on specific usability issues. Further, as our pool of cases has increased, teachers can see the need to carry out formative evaluations where students' responses can have a direct impact on the nature of the website, so as to maximize the benefits the teaching teams can achieve from their websites (Figure 6). This trend has increased the cost-effectiveness of the e3L project.

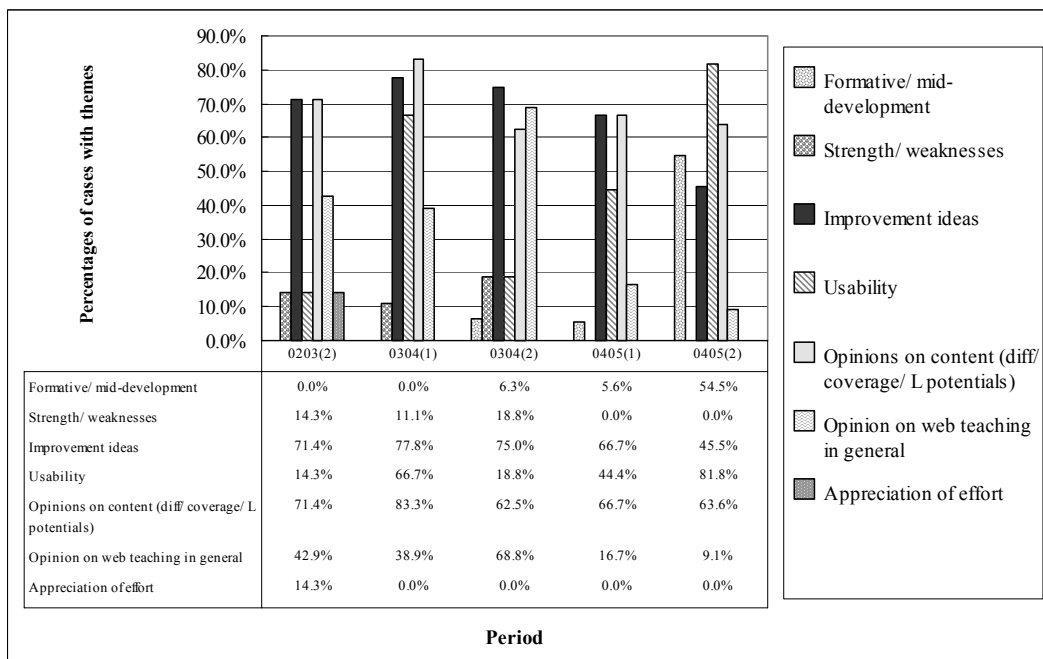


Figure 5: Increasing diversity in evaluations of the learning environments

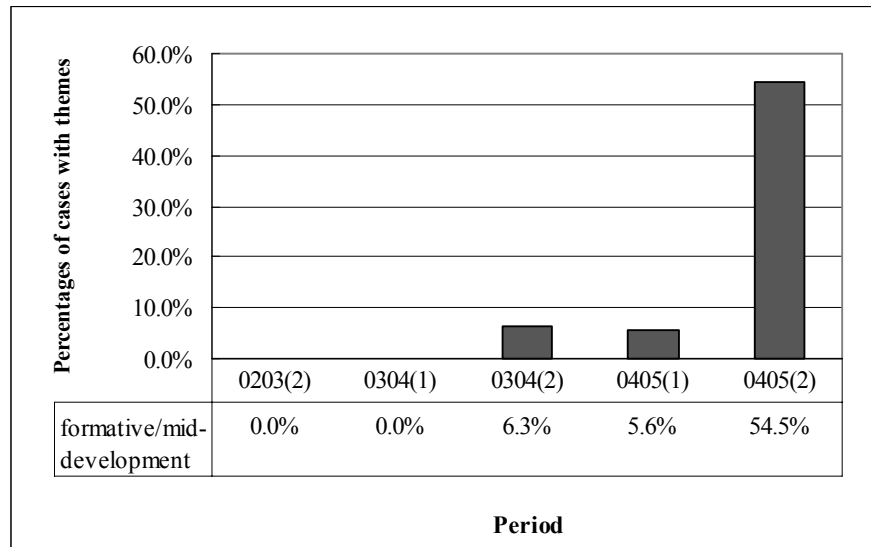


Figure 6: A growing interest in formative evaluation

The same trend is seen in terms of evaluations of the learning process. We have moved from a fairly simplistic notion of ‘engagement’, usually measured by a satisfaction questionnaire, to interest in patterns of use and the nature of communication interactions online (Figure 7).

While this is anecdotal evidence, the second semester of the 0203 academic year was the time of SARS in Hong Kong and, while tragic as a crisis, it changed Hong Kong universities from face-to-face universities to distance eUniversities essentially overnight. This has had a lasting impact on teachers’ understanding of the web as a communication vehicle (McNaught, 2004). That legacy has remained.

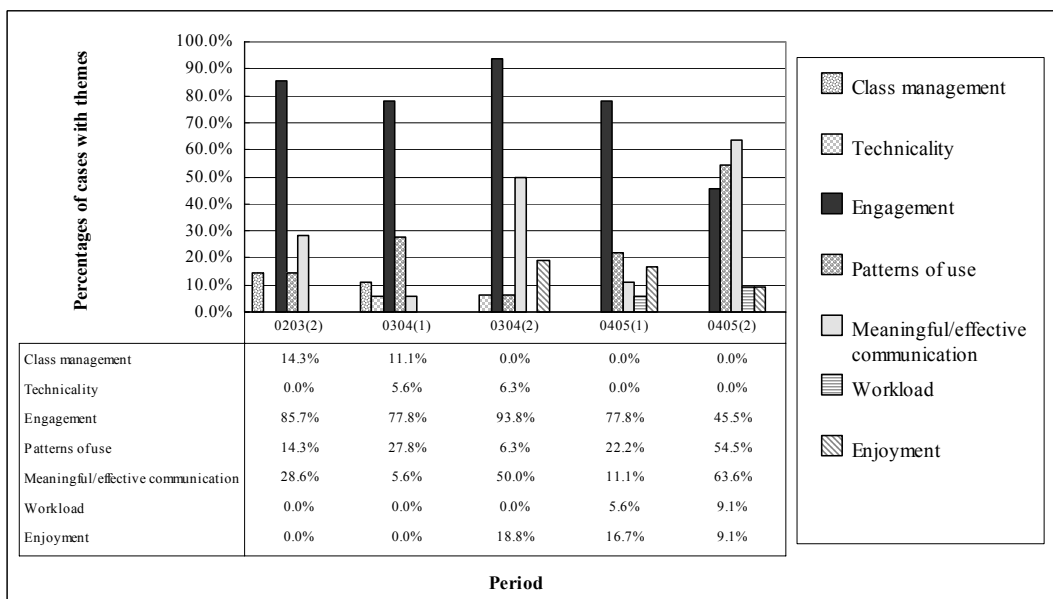


Figure 7: Increasing diversity in evaluations of learning processes

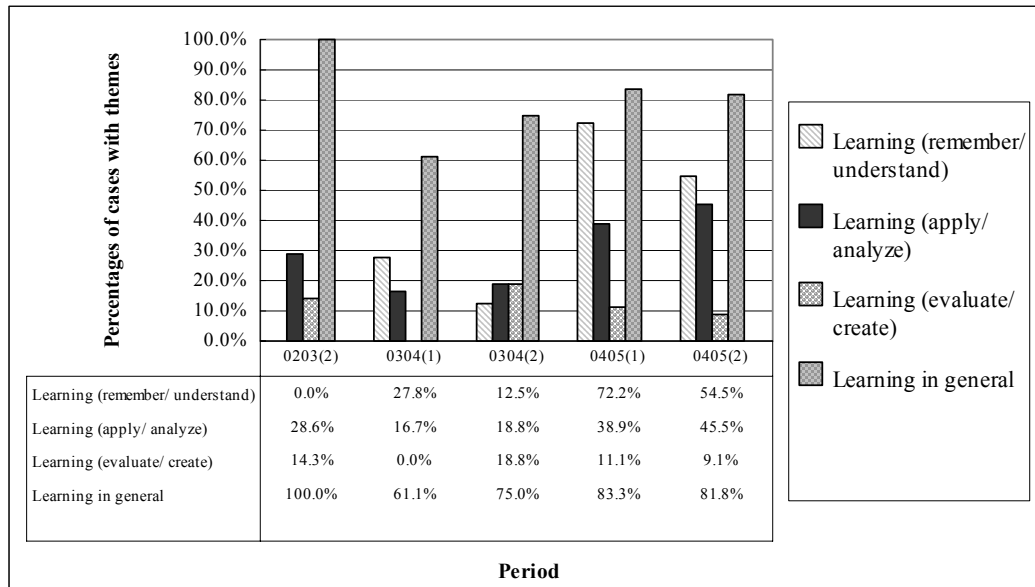


Figure 8: Increasing awareness of evaluating more detail in aspects of learning outcomes

**Greater detail in evaluating learning outcomes**

When considering evaluation of learning outcomes, teachers have become much more interested in finding out more detail (Figure 8). There are fewer questions of the type ‘whether the site has helped students learn’ and more of the type ‘whether the site has helped students put theories into practice’, or ‘... support students to be more able to play a professional role in the field’, etc.

In addition to looking at more detail in the cognitive domain, our teachers do seek evidence of learning outcomes apart from the knowledge domain. Figure 9 shows that there is consistent attention paid to seeking evidence of the development of aspects of learning including a range of skills, motivational changes, learning style changes and reflective capacity.

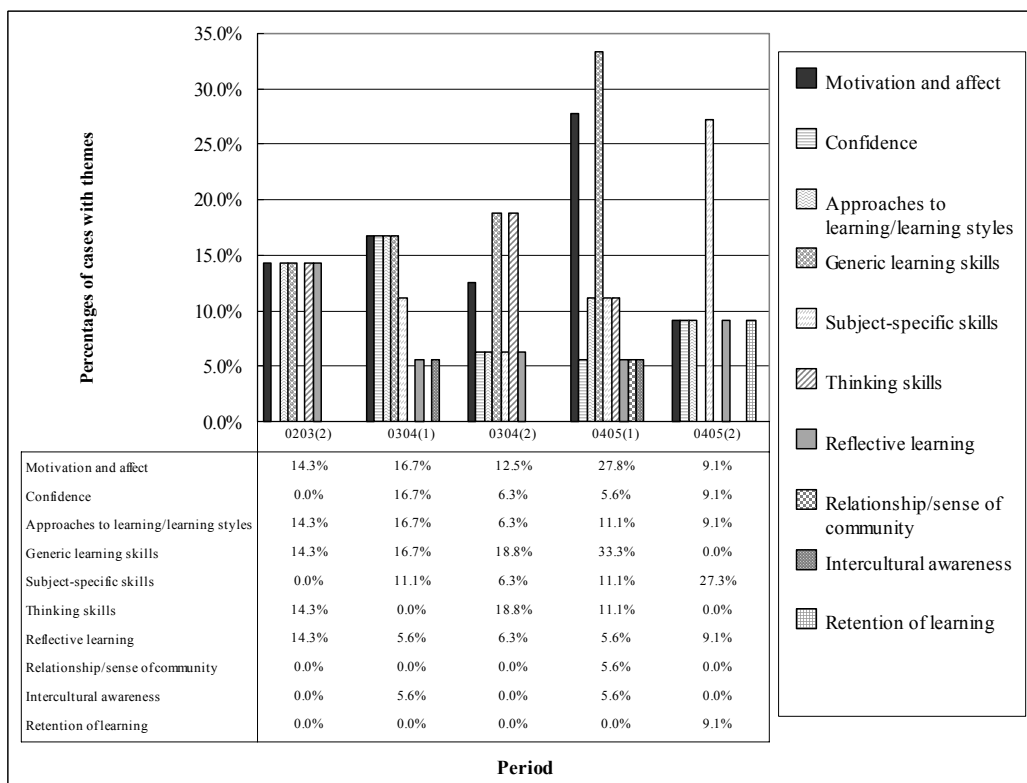


Figure 9: Evaluation of learning as being more than cognitive change



In the first year of e3L there were no interactional studies. However, since then there have been three studies where teachers wanted to investigate whether time spent on the website was related to learning outcomes, measured in a variety of ways. These are simple studies but show an interest on teachers' part in trying to understand the dynamics of eLearning. In the most recent semester we have one study in progress relating students' learning styles to higher order cognitive learning outcomes.

### Matching evaluation strategies to teachers' evaluation intentions

The data above is based on a consideration of the evaluation questions teachers in 70 e3L sub-projects asked. To what extent did the actual evaluations that were conducted (or, in a few cases, will be conducted next semester) enable teacher to get answers to those questions? Table 4 shows the range of evaluation instruments used over the years and Table 5 shows this as data types. Teachers in Hong Kong are accustomed to the use of student questionnaires for evaluation. This we realized in the first semester of the project and recognized that we needed to invest more time in describing the variety of possible evaluation strategies to teachers. Since then, we have managed to obtain a range of data beyond that obtained by self-reporting. Our website lists a number of evaluation strategies (see <http://e3learning.edc.polyu.edu.hk/strategies.htm>) and these are discussed in detail. There is no doubt that strategies such as focus groups, interviews, and detailed analysis of forum postings (eg. see Lam, Cheng & McNaught, 2005) and students' assessment tasks are expensive in time and effort. However, our experience suggests that these evaluation strategies are essential if we are begin to understand how students operate in and learn from web environments.

Table 4: Evaluation instruments and strategies used in the e3L project

| Student surveys         | Course-start | Task-end | Mid-term | Course-end | Surveys (teachers) | Focus groups | Interviews | Web logs  | Forum postings analysis | Assignments/ exams | Others (expert-review/ user try-out sessions) |
|-------------------------|--------------|----------|----------|------------|--------------------|--------------|------------|-----------|-------------------------|--------------------|---|
|                         |              |          |          |            |                    |              |            |           |                         |                    |   |
| 0203(2) Feb 03–June 03  | 1            | 6        | 0        | 8          | 8                  | 4            | 3          | 2         | 4                       | 1                  | 0   |
| 0304(1) Sept 03–Jan 04  | 2            | 0        | 1        | 28         | 20                 | 5            | 3          | 15        | 3                       | 2                  | 1   |
| 0304(2) Feb 04–June 04  | 1            | 0        | 0        | 13         | 13                 | 8            | 0          | 14        | 6                       | 1                  | 0   |
| 0405(1) Sept 04–Jan 05  | 4            | 1        | 1        | 16         | 13                 | 8            | 0          | 17        | 1                       | 4                  | 1   |
| 0405(2) Feb 05–June 05* | 0            | 0        | 0        | 3          | 2                  | 1            | 0          | 11        | 1                       | 2                  | 4   |
| <b>Total</b>            | <b>8</b>     | <b>7</b> | <b>2</b> | <b>68</b>  | <b>56</b>          | <b>26</b>    | <b>6</b>   | <b>59</b> | <b>15</b>               | <b>10</b>          | <b>6</b>                                      |

- some 0405(2) evaluations are still ongoing

Table 5: Data types used in the e3L project

| Semester | 'Opinion' data | Web log action data | Learning outcome data | Other |
|----------|----------------|---------------------|-----------------------|-------|
| 0203(2)  | 30             | 2                   | 5                     | 0     |
| 0304(1)  | 59             | 15                  | 5                     | 1     |
| 0304(2)  | 35             | 14                  | 7                     | 0     |
| 0405(1)  | 43             | 17                  | 5                     | 1     |
| 0405(2)* | 6              | 11                  | 3                     | 4     |

- some 0405(2) evaluations are still ongoing

## Conclusions

This paper has charted the evaluation intentions of teachers in 70 web-supported courses in Hong Kong. Its intention is not to describe the specific evaluations or to describe the overall outcomes of these evaluations. This is being reported elsewhere (eg. McNaught & Lam, in press; Lam & McNaught, in press). We designed the e3L project on the premise that teachers need both educational and technical support if they are to achieve useful results in web-assisted courses. If there is no support many teachers will just give up or remain very basic in their use of the web. Our evidence is that the teachers in these 70 cases have become more sophisticated in their educational thinking during the e3L project. Some of the sub-projects are 'repeat clients' and their planning shows this development. This affirms the beliefs of the e3L staff that, while retaining control and ownership of their educational websites, teachers can quite rapidly learn from colleagues' experience and from expert eLearning professionals, and begin to engage with educational evaluation on a deeper level. Increased interest in investigating the dynamics and outcomes of students' eLearning is highly likely to lead to improved eLearning designs, and we are confident that many of our e3L teachers have developed a critical reflective stance in relation to their own eTeaching and their students' eLearning.

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