

# Collaboratively Exploring and Creating World Wide Web Learning Materials

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## Abstract

This paper reports on research conducted in an Action Learning Project (ALP), *Collaboratively Exploring and Creating World Wide Web Learning Materials*, in which learners were involved in the creation of WWW materials as part of the language learning process. The paper is essentially divided into two parts. The first part focuses on the five objectives of the project exploring the context and ideas involved in the research. The research process, with reference to a model for action learning research, is outlined and the process of the study explained. Findings from the research are discussed.

## Overview

This paper reports on work completed for an Action Learning Project: *Collaboratively Exploring and Creating World Wide Web Learning Materials*, and looks beyond it to a consideration of what might constitute the components of a perfect language-learning programme on the WWW.

## The Focus

The focus of this project was the *process*, not the *product*, of students' learning as they created pedagogical materials. As argued by Crook (1994) later in this paper, it is often difficult to see the immediate results of exposure to the computer. This is also more generally supported by Lai and Biggs (1994) who suggest that most testing contradicts what we know about learning taking place cumulatively, changing qualitatively as it grows in complexity. However, an examination of the processes involved can provide qualitative insights into how learning may take place.

## Objectives

There were five objectives for this research which were:

- to consider how the use of the WWW might accommodate the paperless classroom;
- to explore how the WWW might enhance teaching and, possibly, replace portions of classroom teaching for distance learning;
- to explore how the learners' in-class performance is enhanced when they see how their coursework can be used to solve 'real-world' problems;
- to examine how learners go about creating learning materials in order to understand better the processes involved; and
- to examine how a WWW context might support localisation of the content of learning materials.

In the course of explaining these objectives, we also identify and explain the subjects, the context and the methodology of this research before going on to the findings and the implications.

**Objective One: To consider how the use of the WWW might accommodate the paperless classroom.**

A context for this research was the Division of Language Studies at City University of Hong Kong<sup>1</sup>. For most of the courses in the Division, the teacher prepares a booklet of course materials and distributes a copy to each of the learners, or, a copy to a class representative who is charged with making copies for the rest of the class. The booklet shares the usual limitations of many textbooks: it is expensive to print; the information is static and cannot be updated easily after printing; the information is time-sensitive, that is, extra booklets are often deemed useless and discarded before the next semester's revisions. The first objective of this ALP was to use the WWW to overcome these limitations through the introduction of a near-paperless environment for classroom learning.

**Objective Two: To explore how the WWW might enhance teaching and, possibly, replace portions of classroom teaching for distance learning.**

The English for Specific Purposes (ESP) course in which this paper's ALP activities took place had, as one of its required assignments, the creation of a computer software user manual. It was a small administrative matter to change the assignment to the task of turning the traditional printed course materials into a WWW-based course. The third-year students involved in the course were all completing a Higher Diploma in Computer Studies and were highly conversant with computer technology, including writing hypertext mark-up language (HTML) for the WWW. The subjects seemed a natural choice for the research as the cognitive overhead of learning about computers was less likely to form a barrier to task completion.

Of course, many universities around the world already offer on-line courses, including full degree work up to and including the Ph.D. level (for examples, see Porter, 1997 and Serim, & Koch, 1996). From the point of view of the institutions involved, such distance learning allows for greater enrolment and income at a comparatively lower cost than traditional correspondence courses. Porter (1997, p. 39) outlines the nine considerations in WWW based learning:

- Potentially faster method of distribution
- Limited to learners with access to the Web
- May include hypertext and hypermedia materials
- May be accessed by many learners or a single learner at once
- May include email
- Involves more senses
- Can be updated frequently
- May require security to limit access to learners
- Limited instantaneous interaction between learners and educators/trainers

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<sup>1</sup> In addition, City University of Hong Kong, the setting for this action research, is a computer-rich environment; currently there is a ratio of one computer for each five students with the stated aim of moving towards a ratio of one computer for every three students.

It can be seen that these points are a mixture of positive attributes and cautionary notes. Some benefits, such as “involves more senses” hardly competes with the richness of classroom interaction. In fact, the reality of such courses is that they are simply based on email connections in which the learner receives a traditional package of distance education or printed correspondence-course materials, and uses the email technology to share messages with tutors and fellow students. The other way in which the project under discussion in this paper differed from standard practice, was that it attempted to involve the students themselves in the creation of textbooks.

**Objective Three: To explore how the learners’ in-class performance is enhanced when they see how their coursework can be used to solve real-world problems.**

In our preliminary review of the literature, we found that there was an increasing number of projects in which students were learning with computer resources and that many of these involved learners creating their own websites (for examples, see Bix, Petrillo, Morgan, & Miller, 1996). However, at the time of starting this investigation (1997), we found no examples of students developing their own WWW materials as part of the language learning process. Giving the students the opportunity to learn and practice a set of skills in thinking, planning, designing and writing learning materials as part of their general English learning, also allowed the students to engage in a task likely to solve ‘real-world’ problems.

**Objective Four: To examine how learners go about creating learning materials in order to understand better their ideas of the processes involved.**

This objective emerged from the consideration that, traditionally, students have long been involved in a pedagogic cycle that involves *reading* information on paper and *writing* information on paper<sup>2</sup>. Since the advent of computers, students are increasingly ‘reading’ information from the screen that comes not just in the form of text and static pictures, but which also includes sound, animation and video. The problem today is that we generally no longer teach students to *write* in the ways in which they *read*. The project attempted to address this imbalance by researching the possibilities and problems of having students ‘write’ (i.e. integrate various media and hypermedia) with computers in a way which is more sophisticated than simple word-processing, specifically by looking at how the students perceived the process and product of creating learning materials.

**Objective Five: To examine how a WWW context might support localisation of the content of learning materials.**

A problem faced by many Asian students is the predominance of European and American learning materials in their classrooms. These materials often include issues that do not concern Asian students and fail to include Asian content or examples. This project both satisfied the requirements of their Higher Diploma Programme and also involved the learners in creating materials that could be used by learners in the future. Most importantly, the research has served as a model for learner/teacher co-operative development of WWW learning materials.

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<sup>2</sup> This is, of course, equally true for those who first wrote on cuneiform tablets and papyrus scrolls.

## Description of the Project

The project can be described best by referring to an action learning model (after McLean, 1995). The components of the model, *conceptualization*, *implementation* and *interpretation* are followed by a discussion of their relationship to the project.

### Conceptualization

- Delineate teaching/ learning process
- Identify inputs
- Identify outcomes

During the initial stage, the project was defined, and the teaching/learning processes involved in using the WWW for education were explored with the learners. This involved the Research Assistant helping to create a bibliography of paper and electronic resources useful to teachers and learners, and discussing with the learners the perceived opportunities for WWW-based learning. Students, possibly because of their background in computer science, were uniformly interested in such options. This was, perhaps, because the activity represented a departure from normal classroom teaching, and a way to be involved in learning while taking advantage of their personal expertise with computers. After the conceptualisation stage, the learners were presented with the opportunity to work reflectively in their course as both learners and course-developers, re-writing the course for the WWW. It is important to note that the students were given a choice of continuing to do the traditional paper-based tasks associated with this course, or work with the WWW. All chose to work with the WWW.

In terms of McLean's model, the information and guidance that the students received were considered the *inputs*; the WWW course materials they produced, and an examination of how these were used by subsequent learners, were considered the *outputs*.

### Implementation

- Measure outcomes
- Identify comparison
- Analyse comparison

The conceptualisation and creation of learning materials was held during Semester A (September to December) 1997. Throughout the process, the authors and the Research Assistant examined the creation of the learning materials, as well as learner attitudes and abilities in both creating and using the WWW materials.

Anecdotal information in the form of teacher diary entries were kept for baseline comparison with the two following groups held in the 1998 Summer Semester. But by that time, the course had been slated for redevelopment and the implementation of the proposed distance model for this course was no longer possible.

### Interpretation

- Judge effectiveness
- Judge cost benefit
- Determine action

The effectiveness of the project was judged most concretely in terms of the quality of the finished learner materials, as well as anecdotal measurements of attitudes and abilities.

The cost benefits were judged in terms of comparisons of the investment of time (including teacher time) and materials (as we move towards a paperless teaching/learning environment).

## Evaluation of Outcomes

Evaluation of computer processes in language learning and knowledge building are often problematic. As already briefly mentioned above, Crook (1994) argues that:

It may not be enough to expose a pupil to some software and, some time later, do an outcome test of understanding. The reason this is inadequate is because any such computer experience is more or less situated in some broader framework of teaching activity. In short, there is a risk of casting this educational technology in terms that suggest a medical model of how it works. Computers are unlikely to function as magic bullets - effortlessly releasing their therapeutic effects at points identified by teachers (p. 9).

To evaluate this project, observations, anecdotal interviews and an evaluation of the process and product, particularly in the area of language use, were compared with the control group who used the traditional paper teaching and learning materials.

## Findings

The findings of the project can be examined in light of the five objectives.

### Objective One:

The project succeeded in creating a WWW based course developed by the learners and edited and modified by the researchers and Research Assistant. That website is now available at [www.cityu.edu.hk/ls/171](http://www.cityu.edu.hk/ls/171). However, as stated above, because of changes to the course structure, it is now underused or not used at all. But it is likely, with the recent move towards increased WWW-based teaching at City University, that the materials will be revised and revived to accommodate the new course structure.

In observations and discussions with students, it was found that the WWW can accommodate the paperless classroom, but only if a number of conditions are met. For example, computers and computer systems are prone to problems. For this reason, free and effective technical support is necessary. During the course of this project, booking a computer classroom was not a problem, but recently, demand on computing facilities has meant that classes would not be able to make use of a computer classroom for an entire semester.

The subjects taking part in this project (Computer Studies students) all had their own computers at home with modem connections which meant that they were able to take advantage of the course materials while away from class. But what of a class in which the students do not have their own home computers? Some universities (e.g. Stanford) have made ownership of a computer a pre-condition of enrolment. This might be necessary for any university which is serious about embracing campus-wide computer-based learning. An ideal situation would be one in which learners are able to plug their laptops into a low-voltage power grid available in each classroom desk as well as into a local area network (LAN) offering email and WWW access. Since first writing this paper, the latter option has become available at City University but only for a limited number of specially equipped computers on loan from the university's technical service

unit. A low-cost, well-outfitted university laptop issued to each new student and teacher would be a major step in allowing teachers and students to eliminate paper from the classroom.

After the learners created the materials in Semester B, 1998, they were used on-line by two classes of learners in the Summer Semester, 1998. As a control situation in the study, each of the two classes were given one copy of a paper version of the user manual and told that they could make their own copies (at their own expense), but that the entire course was also available on-line for their reference. It was found that many of the students photocopied critical portions of the user manual at the beginning of the course, such as the course outline and descriptions of the assignments.

When questioned about this, they cited various reasons, such as convenience, but it seemed that in practice, few used even these small portions of the printed manuals and perhaps required them only as a kind of paper 'security blanket'. However, those few who did choose to print out larger portions of the manuals also tended to mark them, adding notes and annotations. This suggests the need for an on-line notepad for learners to work with during classes. During the last part of the course, learners seemed to dispense with the paper manuals altogether and became quite comfortable with the knowledge that the resources were always available on-line.

### **Objective Two:**

In terms of enhancing teaching, the WWW site created in this project did little to improve on the paper materials other than to provide immediate linkage to other educational resources. In terms of distance learning, it can be seen that the materials developed by the students were inadequate in terms of feedback and pedagogical activities. A solution to some of the problems raised in this research has come with the university's support of the WebCT platform. Developed at the University of British Columbia, this platform is a web-authoring software programme that is highly pedagogical. It features some items such as 'chatrooms' and bulletin boards contained on the website developed in this project, but goes further in providing tracking of individual students' participation and input and offers timed tests.

### **Objective Three:**

Anecdotal evidence of the students' satisfaction at solving real-world problems, that is, the creation of actual learning materials, suggested that the project was a success. Comments, taken from anonymous course feedback sheets and teacher diary entries included such statements as:

I liked working with computers to do my lessons.

Making a WWW program is a good way to learn about English.

I talked more with my friends about this than in other coursework.

Because we are computer students, it's good to work with computers in English class.

The question: *Would this be effective with your peers?* was a motivating influence in their reflection on the success of their work. Student comments noted that making something that would be used for other students was more motivating than something that would only be marked by a teacher.

Of course, it is not always possible or practical in every course for students to create their own learning materials, but the anecdotal findings of this research would suggest that having students contribute even a small portion might increase involvement and performance.

#### **Objective Four:**

In general, the ways in which the students went about creating learning materials – or rather did not create learning materials - provided one of the great insights of this project. The materials are extensive but their creation required detailed work with the students to acquaint them with issues such as design, readability and pedagogy. For example, in terms of design, the early versions of the website were populated with inappropriate animations that were irritating to anyone expected to read even a half a page of text. Moreover, the animations were generally juvenile in nature (e.g. dancing pigs) and quite unrelated to the topics or tasks of the pages on which they were displayed. Their appeal to the students in terms of novelty was not balanced with the aims of the website. When questioned about the inclusion of such information, students admitted that the reasons for selection were the visual attraction of the animations and the students' skill in being able to include them. Teachers also noted when students showed their pages to other students, that it was often these features that were pointed out.

In terms of readability, the students failed to understand the relationship between fonts, typefaces and navigation devices. Each group working on the class website generally selected whatever font, typeface and point size they liked without concern for continuity across the pages. Nor did students have a clear idea about the ordering of fonts and typefaces to imply organisation. For example, a heading might be set in a smaller point size than a subheading. It is difficult to understand the root of such behaviour. After all, students are exposed to well-ordered published materials every day of their academic lives. Even magazines and newspapers follow certain orders of organisation that one would expect to absorb and include. When questioned about this, students could see how things might be better organised, but few adopted such measures intuitively.

But the most insightful findings were in the area of pedagogy as the researchers tried to understand the ways in which students perceived classroom tasks and the conversion of information into knowledge. It was found that despite years of education at both the secondary and tertiary level, the students in this research generally had no idea that it might be best to structure information with information gaps and tasks. They appeared to be ignorant of the idea that the purpose was to produce thinking on the part of the learner. Instead, they simply listed page after page of text featuring examples and 'answers'. In discussing this with students, the teachers heard comments such as:

It's more efficient to just give the answers.

Other students just want to know the answer.

There's only one right answer, so I might as well give it to them.

Of course, all the above-mentioned problems are far from being the sole concern of the students. Rather, as teachers we need to reflect on the need to teach students about the nature and methods of learning itself. It may be that many of these students have been exposed to information transfer models of learning in which they were not expected to think. Or it may have been that these students did not realise the benefits of learning through thinking.

Language learning and teaching is a fluid process in which different learner and teacher learning styles need to be accommodated on an almost individual basis. Nunan and Keobke (1997) suggest:

More recently, it has been realized that there never was and probably never will be a method for all, and the focus has shifted to the development of classroom tasks and activities which are consistent with what we know about processes of second language acquisition, and which are also consistent with the dynamics of the classroom itself (p. 2).

In a Computer Assisted Language Learning (CALL) context, it is probably necessary for a computer programme to give learners a degree of control over content and the sequence of instruction. However, as seen in the project discussed above, what a learner may prefer (critical facts set out plainly) and what a learner may need (a pedagogical layer to activate learning) may be two different things. Therefore, a perfect CALL programme must also educate the learner about certain needs in learning and perhaps be a little autocratic in ignoring the learner's preferences!

### **Objective Five:**

In terms of supporting localisation of the content of learning materials, the students involved in the creation of the materials appeared reluctant to create locally relevant materials. In spite of probing by the investigators, it was difficult to understand the reasons why this was so. It may be that there were problems in understanding the task, but also it is possible that they identified with American materials, since the USA is the source of many of the innovations in computing that they study. It may simply be that the international nature of computers did not lend this particular project as neatly to the objective of localisation. Perhaps it would be easier for a course which had, for example, stronger business or cultural elements. When asked about furnishing local examples, students had difficulty understanding the purpose stating:

But everyone in the world has computers.

and

But local people speak Cantonese. It would be better to make the whole website Cantonese then.

This last point, of course, ignores the fact that the course was intended to teach English.

### **Setbacks**

The project featured a few setbacks, generally at an unavoidable administrative level. With the Hong Kong-wide introduction of a credit unit system, the course was modified from its original format, and from September 2000 the course for which this project was created has been subsumed into another course altogether. It was the intention at this point to offer the materials with the learners absent from the classroom, but this became impossible. However, students did build on the lessons learned in this project and produce individual websites as user manuals. An example may be found at [personal.cityu.edu.hk/~96005931/frameset.htm](http://personal.cityu.edu.hk/~96005931/frameset.htm). This is a student website, developed for teaching Eudora Pro Email. Also, in support of some of the ideas generated from this project, during the Summer Semester 1998, materials were created for a new course, *LS2186 Reading and Writing the WWW* found at [www.cityu.edu.hk/ls/course/2186](http://www.cityu.edu.hk/ls/course/2186). For this teacher-developed course, no manual or written materials were produced and learners are required to refer to the website in much greater detail. Learners are expected to create websites and other learning materials, some of which are included in the website.

### **Conclusion**

Computer-assisted language learning is still a long way from taking over the role of a competent teacher and although a computer may be more patient than a regular teacher (Keobke, 1994), and more accommodating to certain types of individual needs (Keobke, 1998), there are still a great many things that a teacher does far better than a computer (Keobke, 1997). Despite these facts, we continue to look at CALL to examine what it does, what it does well, and where it might be improved. In particular, we need to know how teachers should use CALL programmes in the



classroom. Often, our research findings serve to offer insights into the human teaching and learning process by helping to define what it is exactly that we do in a language classroom. For example, the project described in this paper points to the need to educate learners about the pedagogical process of learning over the simple memorisation of information. It was also seen that several problems: technological, bureaucratic and pedagogical, presented themselves.

Careful consideration of the challenges to the creation of a CALL programme may provide directions for future research and development of a comprehensive CALL software programme. The ultimate test for such a programme would be for a language unknown to the teacher, the learner or the community, such as Swahili in rural Saskatchewan, or Inuit in Central Africa, to be taught solely through the use of a computer. Whether or not such a programme is ever realised, the research involved might serve to inform the process of understanding better, best teaching and learning practice.

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- [www.cityu.edu.hk/ls/171](http://www.cityu.edu.hk/ls/171) The website developed for this project
- [www.cityu.edu.hk/ls/course/2186](http://www.cityu.edu.hk/ls/course/2186) A website for a new course, *Reading and Writing the WWW* developed on reflection of experiences from the research