

# **AUTONOMOUS LEARNING THROUGH ONLINE TEACHING**

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## **Introduction**

The possibilities offered by online technology are appealing to many language instructors, particularly at the university level, where opportunities for greater use of new media are often available and encouraged. The flexibility and variety that characterize the internet are frequently seen as presenting new opportunities that were not previously available to language students and instructors. Further, the ability of students to make use of technology without the direct supervision of an instructor offers great potential for the enhancement of autonomous learning and the encouragement of student responsibility for their own mastery. In order to make use of these technological potentials, however, new kinds of material and different forms of presentation are required. The traditional texts and exercises that work well in the classroom are not always appropriate for presentation online and may also require significant and highly-skilled input from an instructor that is not available when students use computer enhanced programs on their own. For this reason, as we consider ways in which new technology can be incorporated into language teaching programs to achieve goals for student learning, it is also necessary that we think carefully about teaching materials and how to put them online.

## **1. Materials Development**

The production of materials for use in university classes has long been a concern of academics as well as of professional authors and developers. The nature of university study frequently requires students to use material on their own outside of class; synthesize large amounts of information presented over a relatively short period of time (usually one academic semester or quarter); and often represents professional-level study of disciplines that is different in nature and depth from what students have typically encountered in school. Traditionally, the material for university courses has consisted mostly of textbooks, either produced commercially by publishers, who usually specialize in this area, or individually, by teaching staff for use by their own students. In recent years, as computer use has become practically universal among university students, many commercially produced textbooks have accompanying CD-ROMs that supplement the printed text. Many individual authors have also moved into the area of CD-ROM production as an extension of their printed material. In both cases, it is perhaps the new opportunities for color,

movement, and interactivity as well as space capacity and cost benefits that make the CD-ROM format attractive.

There can be no doubt, however, that part of the motivation for use of new formats of this kind is a response to a perceived ability, and perhaps desire, on the part of students to use computers in their study. In the case of language study, for example, where mastery of the material cannot be achieved solely through reading, the potential to offer sound recordings and interactive activities is an obvious advantage. It is perhaps for this reason that language instructors and the authors of language learning materials have always been at the forefront of technology use, beginning with audio recordings for use individually by students or in language labs and more recently CD-ROMs, websites, the internet, and online learning of other kinds (Hardesty & Windeatt, 1989; Magrath, 2001).

The availability of new technology, but more importantly its accessibility to university lecturers who are not technology professionals, is affecting a change in the accepted types of learning material for university use. It is now becoming possible to do things that were not possible in the past, and there is also evidence that student expectations are changing. While traditional textbooks might contain pictures, graphs, figures, and so forth, they must still be read by students, and there is really no other method for approaching the material they contain. Newer technology, particularly the latest online systems, however, allow sound, movement, interactivity (for exercises, demonstrations, online discussion, etc), and the incorporation of genuine material such as film clips and recordings from radio or television. These are important advantages in a pedagogical sense as it has been estimated that adult learners retain about 45% of what they see and 25% of what they hear but 70% of what they see, hear, and do (Coleman, 1991). There is also evidence to suggest that students increasingly want material that is self-contained (does not require expert explanation from the lecturer) and that they can access and use at any time they wish (Coleman, 1991; Lafford & Lafford, 1997; Bickerton, 2000; Weinberg, 2002). Increasingly, students may demand the same convenience, service, and costs from universities that they expect from commercial enterprises (Levine, 1997). However, an interesting aspect of student use of new technology is the indication that it may make students more passive (Magrath, 2001) and also less autonomous (Knobel et al, 1998), findings which appear to contradict some of the reasons for using interactive technology in the first place.

In addition to pedagogic benefits and student expectations, increased technology use in university teaching is often seen as a way to adapt to an environment with fewer resources than were available in the past (Bourner & Flowers, 1997). That is, it is often hoped that technology will allow lecturers to reach more students in a more efficient way that also costs less. In practice, though, whatever benefits may accrue from new practices, the frustration level among students who must use the technology has often been significant (Lafford & Lafford, 1997; Hara & Kling, 2000; Weinberg, 2002), and staff are often concerned as well about new demands on their time and expertise as well as potential impacts on their teaching (Hodson et al, 2002). For staff and students at many universities, however, the decision to make use of new technologies in teaching and learning has been made by administrators who view it as the next step in the evolution of modern universities (see, for example, Drummond et al, 1999; Truscott & Morley, 2001; Hodson et al, 2002; van Schaik et al, 2003).

Needless to say, this has placed new demands on university lecturers in terms of materials design and conversion to fit new delivery methods that are technology-based. This paper will consider some of the ways in which materials can be written for delivery in the online environment in order to take advantage of the capabilities of the system and also maximize student mastery and progress. The relationship between online teaching and autonomous learning will also be considered. The experiences of the Indonesian Program at Deakin University in converting four years of conventional tertiary Indonesian language material for online presentation will serve as the basis for discussion here. It should be noted that the move to online delivery of Indonesian at Deakin began in 2000, when first year language units were offered off campus for the first time. Since then, the program has undertaken several stages of materials conversion starting from a conventional-type written text with accompanying sound recordings produced as audio CDs to a simple website in 2000 (first year materials only), the Topclass online learning system in 2001 and 2002 (second and third year materials only), to the present online learning environment supported by Web-CT Vista as part of the university-wide Deakin Studies Online in 2003 (first, second, third, and fourth year materials). The materials available for Indonesian at Deakin now include written textbooks (first, second, third, and fourth year level), audio recordings on CD and online (first and second year levels), written text online (first, second, and third year levels), online interactive exercises of many different types (first, second, and third year levels), and online assessment with full machine grading (first, second, third, and fourth year levels). All

materials were designed, written, recorded, and developed by the staff of the Indonesian Program. It should be noted that these materials are currently used by on campus students, as well as those off campus, and are fully incorporated into the teaching practices and assessment regimes for Indonesian units in both modes of delivery. Further, the discussion to follow relates primarily to the capabilities of materials presentation in WebCT Vista within the context of Deakin Studies Online.

## **2. The Student Centered Approach**

In recent years, a great deal of educational research has focused on ways of making instruction more student centered. That is, it has been recognized that there are benefits to learning when it is students, rather than the instructor, who are the most active participants in the educational process. A student centered environment is often said to be one where students choose what to learn, when to learn, and in what ways to learn. This includes collaborative learning situations and problem-based learning. There has been strong support for this approach in technology-based courses, including those offered online (Brown, 1990; Harasim, 1990; Hiltz, 1994; Jonassen et al, 1995; Turoff, 1999).

Student centeredness has been identified as an important theme in online learning (Kearsley, 2000), which tends to be less structured than traditional classes and relies more on autonomous learning. It has been suggested that, when students are required to take responsibility for their own learning, they are likely to be more successful and the learning process more meaningful to them. Many aspects of this approach have been studied, including the importance of interactivity (Brockett & Hiemstra, 1991; Cavaliere, 1992; Garrison, 1997); the nature of the learning environment (Candy, 1991; Wheeler, 2002); and the value of collaboration (Blumenfeld et al, 1996; Rothwell, 1998; Smith & MacGregor, 2000; Comeaux, 2002).

The relationship between students and instructors is changing as well, as instruction becomes more student centered. In the traditional classroom, which has been described as teacher centered, information tends to flow from the instructor to students. Students may act as recipients of knowledge only. This approach, it has been suggested, involves reproducing knowledge (Entwhistle et al, 1992) and has also been called surface learning (Cairncross & Mannion, 2001).

When learning is student centered, however, the role of the instructor becomes that of facilitator. In this context, students can be engaged in transforming knowledge (Entwhistle et al, 1992) and will relate new information to prior experiences and knowledge (Mayes, 1993; Fowler & Mayes, 2000).

Online learning is particularly suited to the fostering of deep learning that is meaningful to students as individuals and that will allow them to maximize the benefits of the experience. Students can explore a range of material that cannot be made available in the traditional classroom. They can easily be exposed to authentic material that has not been developed specifically for use in the classroom. The experience can be made multisensory, as online presentation allows for sound, movement, color, and interactivity that are not possible with traditional materials. Opportunities can be created for students to interact with classmates to a much greater degree than in a traditional learning context. And, perhaps most importantly, online learning can be flexible and adapted to fit with students' personal goals and learning styles.

### **3. Learning Styles**

It is generally accepted that learning is a complex process with many facets. Further, learners are not all alike. Some, for example, respond best to a verbal presentation of information and tend to think about knowledge through language. Others, however, may prefer visual representations and find images most meaningful. The importance of these differences in learners should not be underestimated as it has been found that performance is affected if information is presented in a format that does not correspond to an individual's preferred style (Riding & Douglas, 1993). However, it is also the case that, regardless of individual differences, learning is more successful when sensory reinforcement is used (Kommers, 1996; Kearsley, 2000), suggesting that the combination of presentation types possible in the online environment has significant benefit for learners as a group, regardless of individual preferences.

It is in attempting to make online study as effective as possible for all students that nonlinear presentation can be put to use. By offering students options in their learning experience and allowing them to select these options based on interest, personal preferences can be

accommodated, learning can be made more autonomous, and transformation of knowledge can be encouraged. Further, students may be more satisfied when choice is available to them, and the learning experience that results may be more meaningful as part of their educational experience (Deci, 1996).

#### **4. Nonlinear Presentation**

Nonlinear presentation refers to a syllabus of materials that is offered to students like a menu from which they can choose in accordance with their personal tastes and inclinations. The term itself is frequently used in the field of information technology to refer to pathways that allow users to choose from a series of options set out in a branching or other orientation. In a nonlinear course or unit, the experience of each student will be different, although the ultimate result will be comparable. In other words, students will choose from a range of materials and activities that will lead them to the achievement of specific outcomes in terms of mastery or creation of knowledge. Needless to say, however, students cannot be permitted to make these choices in an unlimited or unstructured manner. The design of units using nonlinear presentation must guide students onto paths that have been set up to achieve the desired aims for learning.

The existence of online learning systems, such as WebCT, greatly facilitates the design and development of units using nonlinear presentation. Whereas a large amount of purpose-made programming and development was required to support nonlinear presentation of a unit in the past, WebCT incorporates many of the aspects of online presentation that are most useful in this context. These include individual messaging, threaded discussion, real-time conferencing, video, audio, audiographics, and hyperlinks (Kearsley, 2000; Heinich et al, 2002). It is not necessary for instructors/designers to know much about HTML and can develop and maintain their own nonlinear presentation with an achievable amount of training.

Using WebCT, there are several ways in which material can be developed and presented in a nonlinear manner. The most appropriate method will depend on the material to be covered, the aims of the unit, the type of learning desired (individual vs collaborative, etc), and the pedagogical approach adopted by the instructor. For specific units, a single approach or a range of approaches might be desirable. In other cases, however, the instructor might determine that

nonlinear presentation will not facilitate presentation of the unit. The rationale for making these decisions is beyond the scope of this paper but has been discussed in the literature (see, for example, Kommers et al, 1996; Heinich et al, 2002).

Regardless of the online system used, the availability of technology accessible by students in accordance with their own needs means that attention must be paid to materials presentation in the online environment. The nature of learning in the online environment is inherently different from the traditional classroom setting and the way in which languages have been taught historically. For this reason, it is not possible to simply move existing materials online without considerable adaptation as students will not use them in the same ways they would in a traditional language teaching setting and may not, in fact, have the same goals and expectations for language study.

## **5. Written Text**

The potential exists to place large sections of text online for students to use. This might be done in the form of individual content pages, which can be uploaded quickly and added or removed as the unit progresses, or else in the form of modules such that they are an integral part of the unit template. Indonesian uses both formats. Modules are used to duplicate sections of the printed textbook while content pages are used to provide students with supplementary notes and information as well as copies of unit guides.

While there is evidence to suggest that students do not use written text online to any great extent (see I. Fanany, 2003), there are advantages to placing written text online. First, in the case of a language, and perhaps other subjects as well, there may be reasons to limit the visibility of part of the text or to permit students to use text material in a fixed sequence. In the case of Indonesian, the first and second year textbooks contain a series of conversations that are presented in a dual column format with English on the left and Indonesian on the right. In the classroom, this allows students to cover the Indonesian while looking at the English equivalent. Online, these conversations are presented such that students may view the English version of the dialog line by line and then click or rollover to view the Indonesian. Each line of text has a synchronized sound recording so that students can hear as well as see the sentence in question. This is an effort to

enhance recall in the way outlined by Coleman (1991).

Written text presented online can also be accompanied by images (photographs, graphs, figures, maps, etc) that can be better captured in a computer format than in print. In WebCT in particular, images are easily uploaded and incorporated into text, making this a tool that can be used by lecturers in any field with an achievable amount of training. WebCT has a built-in HTML editor that allows for the straightforward conversion of MS Word documents to the appropriate format for presentation. One of the most serious shortcomings of systems tried previously, such as Topclass, was the inability of lecturers to make design changes to the material.

While in many units, including Indonesian, there may be compelling reasons to maintain a printed textbook alongside online materials, it is also likely that some disciplines or some units may benefit from having written materials available online only. If, for example, a unit is structured in a way that requires individual students to use only selected parts of the written material and all students do not use the same sections, there may be advantages to having students use only what they need online. The nonlinear presentation made possible online technologies has been found to be useful in a number of fields (Cairncross and Mannion, 2001), and several authors have suggested guidelines for development of units in this context (Fischer, 1994; Davies and Brailsford, 1994; Kommer et al, 1996). Similarly, it may be desirable in a unit that requires students to view a large number of images to take advantage of the better quality online presentation can offer, the potential for placing large numbers of images online, and the ability of the lecturer to control the timing, order, and orientation of presentation. Nonetheless, lecturers must be wary of expecting students to spend too much time reading material online. The need to scroll up and down, sit more or less immobile in front of the computer, and remain online for an extended period may be difficult for students and could lead to other problems (health issues, online costs, etc). In some situations, depending on the type of use required, the traditional textbook may in fact be more flexible and a better choice than online text.

## **6. Sound and Video**

It is highly desirable for languages (and many other disciplines as well) to have sound recordings available to students. Traditionally, these recordings have been on tape or CD for use by students

independently or with supervision in a language lab. Video recordings are sometimes useful as well but generally have to be shown to a whole class at one time. It is often difficult for students to obtain copies of tapes and CDs for individual use, especially when playback facilities and copies are limited. It is sometimes possible to produce copies for sale to students, but this is not always an option. For this reason, the availability of staff to monitor the use of limited copies or to supervise access to university facilities, such as listening rooms or language labs, is often a major factor in whether students can make use of recordings in an effective way.

When materials are presented online, however, it is possible to store sound recordings, as well as video clips, as individual files that are available to students whenever they log on. In addition to allowing students to access material when they are not at the university, recordings can be used at any time of day. This all-hours availability has been shown to be of considerable importance to students (see, for example, Coleman, 1991; Levine, 1997; Itoh & Hannon, 2002; Chenoweth & Murday, 2003) and may improve the likelihood of students listening or viewing assigned material.

One of the difficulties with online sound and video recordings may be quality. For the Indonesian materials used at Deakin, anecdotal student reports suggest sound quality online has tended to be good in university facilities but variable from other locations. This is most likely a reflection of the hardware students have available at home and elsewhere. Problems with both sound and visual quality have also been reported by a number of other researchers (see Conacher & Royall, 1998; Weinberg, 2002). It may also be the case that sound and image problems are more likely when material is taken from outside sources for use in the classroom (as was the case in the program described by Weinberg, 2002), rather than recorded for the purpose of online presentation. The recordings used by the Indonesian program were all produced by staff for their current use, which may account for the generally favorable impression of quality. Again, however, in Indonesian at Deakin, there appears to be a tendency for students not to listen online as recorded dialogs and exercises are available for purchase on audio CD (I Fanany, 2003).

## **7. Exercises and Assessments**

One of the most valuable functions of the online system is the ability to offer interactive exercises and tests to enhance student mastery and as assessment. Language teaching, of course, has a long history of using a range of exercises in low-technology format, and the benefits of this technique for language mastery are well-known.. The flexibility of current online systems has the potential to enhance the presentation of exercises and drills in terms of possible structures as well as with advantages offered by machine marking, suggesting that this might be an area of future materials development for many language programs.

WebCT, for example, allows multiple choice questions, multiple choice questions with hierarchical answers, true and false questions, fill-in-the-blank questions, and matching among others. Individual exercise sets can be built by choosing questions that have previously been stored in a question database. Sets of exercises can include a variety of question types and can be made such that individual students or groups of students are offered different questions for completion. When multiple choice questions are used, it is possible to have the order of answer presentation randomized each time a student accesses the exercise set.

While it is also possible to use question types that require long answers, it is often desirable to use only short answers that can be machine graded. Manual marking is very time consuming and often adds considerably to lecturers' workload. Building the question database for exercises also takes a great deal of time and thought but would seem to represent a better use of resources if all the finished exercise sets or tests are graded automatically. An entire semester's worth of exercises and assessments can be set up in advance before classes start and released to students as required using the selective release feature of WebCT. As marking and the recording of grades is done by the system, lecturers are freed from these tasks during the semester. Of course, this really represents a shifting of work from semester to non-semester time but, since lecturers must also teach, prepare, engage in administrative duties, and deal with students during the teaching weeks, the spreading of workload that results may still be an improvement over having to add assessment to the semester load. It is also the case that online testing cannot replace every form of assessment now in use (such as essays) but may still be a very effective replacement for mid-semester quizzes and tests, short assignments that contribute to assessment, and so forth as well as a tool

for students to practice what they have learned.

A decision to use machine marked exercises, whether for assessment or not, means that lecturers must think about the design of questions to be presented in this format. For many, this will represent a new way of approaching their own material and a departure from more traditional methods of testing students or allowing them to practice their knowledge. Where students were often given the opportunity to express their understanding in their own words, either in short answers or in essay form, the new format means that they must choose, in some form, from a number of possible answers. In short, from the students' point of view, the possibilities for fudging, hedging, and receiving partial credit are greatly reduced. On the other hand, the potential for the marker to be influenced by personal knowledge of the student, his or her own views on the subject in question, and variable factors such as handwriting and spelling is also eliminated.

A number of researchers have described the theoretical and practical considerations in designing interactive multimedia (see, for example, Coleman, 1991; Davies et al, 1994; Gordan, 1994; Hemand, 1997; Lynch & Horton, 1997; Bickerton, 2000; Levy, 2000; Stanton et al, 2001; Cairncross & Mannion, 2001), but the majority of these studies have centered on general principles such as the need for designers to know their intended audience, to have clear goals, to understand the abilities and limitations of the system they must use, to consider appropriate levels of conceptualization, to plan for evaluation of the design, and so on. In addition to these broad principles, a number of more practical considerations in item design are worthy of thought:

1. Minimize the possibility of guessing – If machine marked exercises and tests are to have value as an assessment or diagnostic tool, students should not be able to guess the correct answer. While it is not possible to completely overcome the potential to achieve a correct answer by guessing, it can be minimized by appropriate question design and also by choice of type. Of commonly used types, multiple choice questions with four alternatives reduce the probability of choosing a correct answer by chance to 25%. (It is, of course, possible to design questions with more than four alternatives and hence reduce the probability further but the awkwardness of designing choices and the potential confusion of students faced with so many choices may make this a less desirable alternative.) Matching exercises also make guessing correctly difficult, but the odds of guessing correctly are significantly enhanced if a

student is certain of one or more of the matches.

2. Maximize the use of features that allow for varying student experience – One of the drawbacks of machine marked exercises that is often cited by lecturers is that the potential for students to cheat seems very great, especially as students tend to complete these exercises without supervision. If, however, the order in which answers are presented for a given question is different for each student and/or the order of question presentation is different each time the exercise set is accessed, there is little value to students in copying someone else's answers. Experience shows that students are often unaware that answer order is randomized and that the exercise sets or assessment tasks they do are not exactly the same as those done by other students. Setting a time limit for completion of assessments also means that students will have to concentrate on their own questions in order to finish within the allotted time.
3. Design questions and answers with knowledge of student weaknesses – While most lecturers would not wish to trick students into answering incorrectly, a knowledge of where students are likely to make mistakes can be used very effectively in designing answer alternatives. In any discipline, there are likely to be common errors that students make because they seem plausible to them. Including these as incorrect answer alternatives makes it possible to assess students' understanding in relation to areas that are commonly misunderstood or imperfectly mastered.
4. Take advantage of selective release functions – As materials available online, including exercise sets and assessments, can be released to students selectively by date or by student group, it is possible for the lecturer to closely monitor and control class progress. This is particularly valuable as a timesaving method. Exercises or assessments can be available 24 hours a day during a specific period. This allows students maximum opportunity to complete the work but does not require a lecturer to hand out papers or collect and mark them. Similarly, selective release allows the needs of student sub-groups to be accommodated (such as students who miss class due to teaching rounds or clinical practicums) and also for the same material to be used by on and off campus students even if their unit schedule differs. Selective release information can be preset at the start of the semester allowing lecturers more

time for other tasks during the teaching weeks. It is the case, though, that many students are apprehensive about machine grading (see Chenoweth & Murday, 2003). This can be alleviated to some extent by insuring that students are given a long enough period of time to complete each assessment and also that the assessment is available over several days to allow flexibility and perhaps encourage high completion rates.

5. Be careful about incorrect information – An area that may give rise to many conceptual problems and that should be considered carefully in using machine marked assessment is the issue of offering students incorrect information as part of exercises or assessments. By definition, questions that require students to choose one or more alternatives must also include a number of incorrect answers. Students generally have trouble distinguishing between correct information and incorrect information (thus giving the exercise value as a diagnostic or assessment tool). However, it is not possible to predict the degree to which students remember wrong information they may see as part of an exercise or assessment. In the case of a language, this is a particularly important point because students usually lack the experience with the language being studied to determine, for instance, whether forms are wrong or right. It all tends to seem plausible, especially in an assessment task. To address this issue, it is useful to think about information to be presented in terms of being contextually incorrect as opposed to impossible. If an answer alternative is contextually incorrect, it does not fit the question or information context. If an answer is impossible, there is no context where it might occur. A simple example in English will illustrate the difference. If students were asked to choose the form of a verb that appropriately completes the sentence, *I \_\_\_\_\_ lunch with John yesterday, eat, will eat, and do eat* are all contextually incorrect because they cannot occur in this sentence. Nonetheless, there are other possible English sentences where these forms can be used. *Eated*, however, would be an impossible form because there is no situation (context) in English where it can occur. In language, certainly, impossible alternatives of this kind should not be used. All incorrect alternatives should be contextually incorrect but possible in some other context such that students are not exposed to nonsense forms. For other disciplines, this is a distinction lecturers may wish to make based on the nature of their subject matter.

## **8. Discussion**

The use of online technologies in university teaching is still developing, and we do not have a long history of use to assist us in what we do. This is the case in some disciplines more than others, but generally it is still difficult to determine whether online materials are as effective as traditional ones in addressing certain pedagogic aims. While many studies of the effectiveness of technology in teaching have appeared since the 1960s, it has been suggested that they do not conclusively indicate any potential advantages associated with technology use (Burston, 2003) and have not led to meaningful improvement in student outcomes (Russell, 2000; Magrath, 2001), although this can be taken to mean that technology use is as good as more traditional methods (Burston, 2003). Nonetheless, it has also been suggested that new technologies offer new opportunities to develop high-quality learning environments that are richer and more complex than any of the more traditional formats that have been available in the past (Cairncross & Mannion, 2001). Technology use may also allow universities, and individual programs, to compete in the international arena and to reach students who might otherwise be unable to participate in higher education (Stanton, et al, 2001).

To this end, the design of materials for use online takes on added importance, both in terms of pedagogical aims and in achievement of student outcomes. Poorly designed material may lead students to focus only on its superficial, dynamic aspects, rather than actually master the content (Rogers & Scaife, 1997; Aldrich et al, 1998). This is frequently the case with commercially produced interactive learning material (such as for languages) which often fails to address student characteristics and situations (Levy, 2000; Cairncross & Mannion, 2001) and may lead teaching in the online environment to become another branch of what Bickerton (2000) has termed “edutainment”. University lecturers have a clear advantage here in designing their own materials for use online. They are intimately familiar with the context in which the materials are to be used as well as with the characteristics of their student group. The materials that they are placing online are usually ones that they themselves have used before in more traditional forms and they usually work from a completely developed syllabus and assessment regime. While the period of the changeover from traditional to online materials is difficult and labor-intensive, the results for many lecturers and programs are likely to be very satisfactory in the long term in terms of time saved, better fit between materials and student needs, and even ease of maintenance. In order to

achieve these long-term benefits, though, it is important for lecturers, as they double as designers, to carefully consider each decision they make in relation to online material to insure that pedagogic goals are met.

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