PRACTICAL STRATEGIES FOR USING COMPUTERS IN LEGAL EDUCATION

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1. Introduction

Queensland University of Technology's (QUT) School of Accounting Legal Studies has nearly 1,000 undergraduate business students who undertake subjects as part of their business degrees. Undergraduate courses are predominately in the areas of business law, corporate law and taxation. An undergraduate 14 week semester subject consists of a weekly two hour lecture and a one hour human led tutorial. The educational objectives of the subject are to have students reach a basic understanding of the fundamentals of the particular area of law and to develop legal reasoning skills.

The School has been developing computer based education in since 1987. Park and McGregor-Lowndes described the early stages of the project to 1992 that involved producing question and answer lessons for QUT students.[1] The project has since adapted its tutorials for use at other Australian Universities and in a self contained disk that is published with the text, Understanding Company Law.[2] In early 1995 two further stand alone disks were produced, one containing general business law and the other being specific to contract law.[3] Both disks are cross-referenced to existing texts[4] and are designed to supplement other learning activities.

The project group is currently developing a prototype multimedia CD-ROM product on corporate law. The program includes a hyper-text library of such material as Understanding Company Law, Companies and Securities Law: Commentary and Materials,[5] the Company and Securities Law Journal and the Australian Securities Commission Digest. It also includes sound and animation explanations of parts of corporate law, question and answers, gaming and practical simulations of legal and company secretarial matters.

2. Department of Computer Based Education

The University has adopted the strategy of centralising its computer based education (CBE) production facilities. A team of about 25 educationalists, programmers, graphic artists, systems analysts and managers work in co-operation with content experts to produce computer based education. The material is delivered to students on four geographically separate campuses by over 500 networked computers.

Most faculties of the University are using some form of computer based education for undergraduate classes, especially large classes located on several campuses. This includes such diverse areas as physics, chemistry, accounting and maths to nursing, languages and the arts.

Apart from disks that students take home to use on their own computers, the network delivers substantial hours of computer based education. In 1994 12,285 students used the facility.

The department receives some monies from the University budget, charges university faculties for developing projects and also engages in outside consulting to earn revenues.
3. Completed Computer Based Products

3.1 Internal Weekly Tutorials

The School has developed three CBE project areas; business law, corporate law and taxation. These subjects all have large numbers of undergraduate students located on different campuses.

The first step in each project was to provide a weekly computer based tutorial for students that would take an average student 30 to 40 minutes to complete. This was to be in addition to lectures and tutorials. The computer based tutorials had to be easily accessible to students through networked QUT computer laboratories.

3.2 Assumptions, Philosophies and Objectives:

The prime objective of the computer tutorials was to act as a comprehension test of terminologies and concepts introduced in the weekly lectures and readings. It was expected that this would encourage active reading of the text and so enhance learning of the fundamental concepts by students. Human led tutorials could be largely devoted to developing analytical problem solving skills involving higher level legal reasoning. We had always aimed to develop problem solving skills in tutorials, but hoped that after the computer tutorials it would be done on a firmer student grasp of the fundamental concepts of the law.

How can a computer assist with reading, and learning from, a book? Recent work by reading theorists has demonstrated that those who understand and retain most of what they read, do so by reading actively. They anticipate what is coming next, they periodically review what they have read, and routinely monitor their understanding. This process, which is called active engagement with the text or comprehension monitoring, is precisely the basis of the computer disk that accompanies the book. It is not intrusive or prescriptive, and it certainly does not replace the need for careful reading; it does not replace lectures or tutorials; it simply encourages the reader to check and confirm his or her understanding of concepts and principles before moving on to the next section or next chapter.

We believe that students who have taken the time to familiarise themselves with the lessons and use it as they study have more confidently approached tutorials, assignments and exams. This greater confidence comes from an assurance that they understood the terminology and basics before moving on to higher order concepts and more advanced applications.

We observed that several students were having difficulty with concepts built on previous learnings in other subjects. For example corporate contracting is difficult to understand without a grasp of the law of agency. We direct students to materials that would refresh their memories and then devised computer tutorials to test their comprehension of such materials. We envisaged that human led tutorials in this area would be spent less in revising agency law and more in exploring the issues of corporate contracting.

We proceeded on the assumption that, despite the enthusiastic predictions of some, computers will never replace entirely books and other printed sources of information, just as they will never render obsolete the human teacher. Computers can, however, bring large amounts of information within people's grasp. Perhaps more importantly, because of their enormous power, their infinite patience, and their ready availability at almost any time or place, they can be a powerful ally in the learner's search for understanding, and can release teachers to do what they do best: to discuss important ideas and to work with students. We proceeded on the assumption that computers can actually improve the process of learning, by doing things that human teachers find repetitive, difficult or unrewarding.

The CD-ROM project that we are now working on has departed from these assumptions. We shall see just how far we get in creating a "computerised law professor".

3.3 Systems The authoring system used was Author, a product of Microsoft of Melbourne. The authoring system allowed the presentation of different questions to the student at random. Each student's answer was assessed by the computer and remedial feedback provided to the student. The question types include: short answer; multiple choice; numeric variable: identification: true/false; point (point at feature on the screen).

The tutorials were delivered through the university's computer laboratories via a Novell network to over 500 work stations. A specific number of question were presented at random to the students from a larger question data bank. Question data banks have now reached over 100 questions a lesson in some cases, and only 15-25 are presented in any one lesson. Possible solutions to multiple choice questions were also randomised, as were questions containing figures for calculations. This randomisation assisted in preventing students becoming bored with revision of the lessons or mindless cheating through copying another's attempts.
Each student's results were recorded and could be aggregated, assessed and manipulated. This assisted staff in identifying poor achievers and in assessing the difficulty of questions.

3.4 Current status

The tutorials are now an integral part of the teaching and learning strategy of the course. They are constantly reviewed and updated.

After various experiments students are obliged to complete 75 percent of the tutorials with a mark of at least 75 percent. Fifteen multiple questions based on those from the tutorials form part of the mid-semester or final examination paper. This encourages and rewards use of the computer tutorials. The majority of students use the computer tutorials in excess of the minimum prescribed time.

We are now experimenting with replacing parts of the human led lectures with some basic screen based instruction and testing. For example, the process of incorporation is a fairly straightforward procedural part of the course. We do not lecture on actual incorporation procedures but direct the students to readings on the subject and a computer tutorial. The tutorial has a number of screens of information that the student can read, which are like lecture notes. A series of questions is then posed to the students by the computer. Feedback on answers is delivered by going back to the screen text where the solution is to be found. We are also testing options such as if the student makes three mistakes in a row then they are forced to re-read the screen again before attempting the computer tutorial. This permits human lecturers to spend either more time on conceptual matters or introduce new material. For example, in the incorporation example that has been used here, one might spend the time saved by spending more time on the corporate veil or introduce a discussion on the ethics and social consequences of the corporate veil.

Each semester students are surveyed about the computer based education experience. This has been a valuable assistance in reviewing the programs, content and administration of the computer tutorials.

3.5 Tutorials on disk

After use of the tutorials internally, we began discussing the idea that the tutorials might be marketed with a major text in the area. Legal publishers were approached with demonstration disks. They showed some interest, but nothing eventuated at that time. It was the opinion of the publishers that the market was not yet ready for such a product and computers were not readily available. Several years later the Law Book Company agreed to publish a disk with their corporate law text by Lipton and Herzberg.

3.6 Understanding Company Law Project

Negotiating the contract to make the disk a reality was a complex task and it was only with genuine commitment by both parties that an agreement was forged. Traditional rates of royalties or even the concept of royalties do not necessarily suit the production of computer based education material. The problem of infringement of copyright, particularly in the student market, is chronic. If the disk had not been marketed with every copy of the book then the cost of the disk would have probably made the venture uneconomic. The legal publishers who venture into the electronic market will need to depart from the traditional way of doing business in this field, and to some this is a substantial challenge.

Producing a mass distribution computer program to a book publishing deadline is also a difficult task. The master disk had to be completed shortly after the finalisation of page proofs to enable coordination with the packaging of the final product. Final proofs were needed to allot page numbers to each student feedback screen. The mixture of changing content, base program alterations, system compressions and making it student friendly were a recipe for either a program with system bugs or a delayed completion date.

We maintained our original philosophy of designing the tutorials as an aid student learning. The project was split up into four main lesson modules: Introduction to Corporations; Corporate Financing; Corporate Management; Corporate Restructuring.

Each module contained 5-6 lessons that generally ran on a one-to-one basis with chapters from the text.

Questions in the lessons are randomised as were multiple choice solutions. The program permitted registration of students, and the recording and printing of their results. The program also included a detailed lesson on using the program and the computer.

To fit all the material on to one disk was a challenge. There are serious cost and ease of installation implications for having more than
one disk. The program was encrypted and compressed. This has meant that installation must be to a hard disk by unpacking the material from the master floppy disk. Most of the problems experienced by students using the tutorial disk have been in this installation phase. The usual problem is that they fail to realise that the disk must be unpacked to their hard disk and proceed to expand it back to the floppy drive which then overwrites the compressed program.

A hard copy Teacher's Manual was produced. The text of all questions and fact scenarios on the disk were reproduced with the suggested solution. The randomisation configuration was indicated. The Teacher's Manual included a tutor mode disk. The tutor mode program has some features that are not available on the student disk. The randomisation is turned off and questions can be examined without proceeding sequentially through the program. This enables easy and quick access to specific questions.

Program design is an intricate balancing act involving competing considerations such as the size of the question bank and disk space available, size of the question and the size of the feedback provided to students. We have arrived at our compromises after several years of testing with our students. It is appropriate to justify some of our most difficult trade offs.

The length of a lesson module has been set at approximately 15 questions. This does not comprehensively cover all aspects of some lengthy chapters. Some of our internal lessons contain over one hundred questions. The problem with producing more questions is the capacity of space on the single disk and capacity of the student to cope with more than 15 questions at one session. This number of questions will take an average student seriously considering the answers about 30-45 minutes at least. Our research has shown that for the average student after 15-20 questions in a session without a break, learning proficiency diminishes.

Short answer questions provide a variety in question formats and challenge the student to provide an unprompted solution. The difficulty is anticipating the possible variations to the solutions and drawing the line between those that are acceptable and those that are not. Our experience has been that this is not an easy task and is a potential source of student frustration when variations are not recognised. In order to overcome these problems, "hints" have been used to guide the choice of the solution and the program constructed so that it accepts a range of correct solutions. Correct spelling has been regarded as a virtue to be encouraged and the program will usually not accept such mistakes. The program will permit some variation to short answer solutions, for example where the answer is "Yes", it will also accept "y", "Y" and "yes". The variations that are acceptable are noted in the Teacher's Manual. An asterisk after a short answer question indicates that variations of the word will be accepted.

The amount of space devoted on the screen between the question and the feedback once the question is answered is also a trade off. We settled on three lines of feedback. Often this did not permit full case citations to be included in the feedback. We believe that this is compensated by the reference to the page of the text that is relevant to the question.

This is found on the graphic of a book that appears on the bottom right of the screen after the question is answered.

The program system has worked to our knowledge without a flaw. The problems reported so far have concerned inappropriate installation by the user or inadequate computer hardware on the part of the user. There have been some minor matters of content. Most have concerned the three lines of feedback on the answering of a question by a student. The issues have involved the misleading nature of the feedback due to its brevity. We have always struggled with this issue as mentioned above.

The delivery platform will only operate on DOS operating systems and will not work with Apple machines. This is a severe limitation that could be overcome, but is not economically feasible at present. Given the number of Apple based machines in tertiary institutions this is a critical area to be addressed.

The hardware required to run the program is at the higher end of the range of computers available to students. Students are often using older machines that are adequate for the purposes of word processing and spreadsheets, but not colour graphics. We believe that this will rapidly alter however. Business students appear to be far better equipped than law students.

Our experience has been that use of the computer tutorials for formal course assessment is not its optimal function. Strict assessment procedures require that all students participate in the assessment at the same time on the same questions. This may cause logistical problems for large student cohort and would require the randomisation of the present configuration to be removed. Our philosophy is that the computer tutorials are a learning tool, not a formal assessment tool. The computer tutorials should be part of a student learning strategy rather than solely relied on to replace human-led tutorials and other interactions with students.

We initially used a small assessment component to encourage students to use the program, but this has been discarded as unnecessary. We find that nearly all students use the program without such incentives because they believe that it assists them to learn and so pass other forms of assessment.
We have recently completed two more commercial projects in 1994, both with the Law Book Company to produce companion disks. The first is with Turner's Australian Current Law and the other is with Graw's An Introduction to the Law of Contract. They are similar to the Understanding Company Law project but include some new features. One such feature will be the inclusion in the feedback to the page references of two other popular texts.

4. The Future - Corporate Law CD-ROM Project

Our School has received funding to develop a prototype multi-media corporate law learning centre. It is designed so that the program can be delivered via a CD-ROM, which could be accessed through the University Library or students could take home the disk. The project began in late 1993 and it is expected to be completed in 1995.

Our aim is to produce a prototype CD-ROM which acts as a corporate law learning centre.

4.1 Our objectives are: To maximise student freedom to choose between different resource presentations; To present resources involving as many senses as possible; To maximise interactive responses; To present a broad range of resources ranging from texts and casebooks to practical simulations.

To achieve these objects we are seeking to use graphics, animations, photographs, music and taped conversations in conjunction with expert systems, simulations and hyper-text retrieval. We deliberately have not included video. This is because of difficulties with technical quality, disk space limitations, cost and marginal value to the learning experience in this particular instance.

5. Design Team

The Queensland University of Technology has allocated $200,000.00 for the initial prototype. The project uses staff from the Department of Accounting Legal Studies, the Computer Based Education Department and the facilities of the Audio Visual Department. The team comprises: 2 content staff (the authors of this paper); 2 educational designers; CBE Project manager; Computer Programmer; Systems programmer; Graphic Artist; Session Programmers; Audio Consultants (for the recording and selection of voices and music); Photographers.

6. The Program Scheme

The student is presented with a graphic representation of an office floor plan. Each room represents a different part of the program which can be accessed at will. Once in each room, the student may select one of 24 subject areas corresponding with the chapters in the text Understanding Company Law by Lipton and Herzberg.

Consistent with our philosophy of permitting students as much flexibility as possible, students are permitted into any part of the program at will and can link with the minimum of difficulty to any section of the program. However, some students like to be provided with a guide and this has also been provided for in the program. In the audio-visual presentations, the student is introduced to a cartoon alien character, named Moz. Moz, from outer space is a novice in relation to the concepts of corporate law. The intention is that the student has an empathy with a being that starts with no understanding or concept of Australian corporate law. This allows for colourful graphics and provides a chance to insert humour. The main explainer is Barbara Beagle, a partner of the law firm Bulldog, Bloodhound and Beagle. Barbara has been charged with the responsibility of explaining the concept of current Australian corporations law to Moz. Other members of the firm are also available to assist to Moz.

5.1 Reception

As would be intuitively expected, the reception contains the major "help" functions for a student unfamiliar with the program. It has a self directed tutorial about operating the computer, keyboard, mouse and common commands used in the program.

It also contains assistance beyond the technical issues of using the program. This is where there has been incorporated information about using the program to aid a student's learning. Several tests will be included which will analyse a student's present aptitude to self directed learning and their preferred learning style. This part of the reception is quite innovative and is subject to extensive testing and evaluation by our educational consultants.
Students may receive guidance about how to tackle the subject matter through the planner diary. It will list tasks for the student according to their learning styles. It will also keep a record of their passage through the different tasks and allow them to make their own notes.

5.2 Library

The library contains a range of materials that an undergraduate student may be required to refer to in the course of their studies. Any part of the library may be printed together with an automatic reference or loaded to an electronic notebook. It will also be possible to place bookmarks and also make notes in the textual material which will be represented by an icon of a “post-it note”.

A facility to dial into an external Australian on-line data base of current law is also being provided so that users may update the information on the disk by further searches.

The library includes the following; Lipton and Herzberg, Understanding Company Law; Redmond, Companies and Securities Laws, Commentary and Materials; The Corporations law; ASC brochures; Companies and Securities Law Journal; Audio slide presentations; Index, to short descriptions with links to text on selected hotwords; Glossary of terms; Bibliography of the current chapter and module; and A link to searching on-line legal data bases external to the program.

5.3 Board Room

In the board room the student may select from a variety of quizzes and games. The user can chose any quiz or game option or can utilise the Day Planner as a guide.

The questions and answers are based our present data base and are similarly in the form of short answer; multiple choice; numeric variable; identification; true/false; point (point at feature on the screen.

The feedback provided in response to answers has been greatly amplified when compared to the similar questions forming the tutorial disk currently accompanying the Lipton and Herzberg text. Feedback responses differ according to the student's answer. The student may link selected hot words for a further expansion of the answer. If desired a score is kept. A series of scenarios with corresponding questions provides for a relatively practical application of the knowledge gained.

Crossword puzzles have been compiled to primarily test a student's grasp of definitions and concepts. The crosswords are in fact a series of fill-in-the-blank questions, but formatted and presented in a manner familiar to the student. The theme of each crossword varies from narrow topics and crosswords on particular cases, to general crosswords on Corporate Law.

5.4 Office

The office is the setting for most of the interactive communications. Areas of the Corporations Law which we know from experience students have difficulty grasping are presented in a variety of ways. This may take the form of a audio-slide presentation or a practical simulation. Again, the student may make a selection from a menu or follow the recommended guide in the daily planner.

The office is the location where the student meets Moz, the alien character who learns about the Corporations Law from Barbara Beagle. Moz also has the ability to take us back in time, so permitting interviews with judges and parties to some of the more important corporate law cases. For example one of the parties to the case explains the facts of the case. This is followed by the appropriate judge giving a summary of the reasons for the judgment. For greater detail the user may link into the library. Parts of these slide-audio presentations are also available in the library.

This option contains a substantial amount of voice content. The user has the option to turn off the sound and read the equivalent written content, or use both sound and text. Graphics are maximised, utilising figures and animation to reinforce concepts.

Simulations are also employed in the boardroom. An example of a simulation arises in the area of incorporating a company. Barbara has introduced Moz into the law firm to undertake work experience. Moz is handed 3 files from the senior partner. Each file contains recently acquired instructions from clients who require a company to be incorporated for business purposes. Detailed facts are supplied. A procedures manual is supplied reflecting the office manuals utilised by law firms. The student steps into Moz’s shoes and
interacts through a series of menus and options including: Interview client for more information; Research Library (including ASC pamphlets); Search Names Register at the ASC; Reserve Company Name; Prepare the Memorandum and Articles of Association; Select a Company form to complete; Prepare the Consent of Proposed Directors; Documentation complete.

The student must actually complete screen simulations of company forms. When the documentation is complete the user, in the guise of Moz, has the choice of having the documentation checked by a partner or lodging it with the ASC. Appropriate responses or requisitions are given. Ultimately a Certificate of Registration will appear and user, as Moz, then attends to the post-incorporation requirements. The partnership rewards Moz for efficient work.

5.5 Tea Room

The tea room is a new direction for us. It provides some light hearted relief, but has some serious aspects. Features include: recorded anecdotes by actual judges, regulators, solicitors and academics in corporate law; gossip within the law firm; selected lighthearted crossword puzzles; pause option for the user to take a real coffee break.

The recorded anecdotes are perceived to be a very important part of the learning centre. Anecdotes were often used to explain difficult concepts in our normal lectures. Most students relate and learn from an appropriate anecdote. We have sought tape recorded anecdotes from experienced corporate law teachers, practitioners and scholars to be accessed from the tea room.

6. Conclusion

The paper has chronicled the attempts of the School of Accounting Legal Studies at the Queensland University of Technology to introduce computers into its students learning strategies. Its initial strategy was to produce computerised basic comprehension testing for students. This encouraged more timely preparation by students permitting a better use of human led tutorial time.

The second phase of producing a comprehensive legal learning centre on computers is a larger, more expensive and complex task. It is yet to be seen whether the CD-ROM prototype is a valuable resource for undergraduate students. This is the ultimate test that any computer based program must pass.

Notes:

in several ways and helped them to enhance their education process in a very short period of time.