9th BILETA Conference
The Changing Legal Information Environment

11th & 12th April 1994
Scarman House
University of Warwcick
Coventry

CASI - Spinning a Teaching Web

Donna Buckingham

Keywords: Computer assisted statutory interpretation (CASI) - Computer based education (CBE) - statutory application - statutory interpretation -navigation web - Hypercard - modules.

Abstract: This paper documents development of the first suite of computer based lessons to be produced at the Faculty of Law, University of Otago. CASI (computer assisted statutory interpretation) is written for a first year law class of over 500 students who compete for 180 places in the undergraduate Bachelor of Laws programme. The CASI suite consists of three modules, offering analysis and application of a statute (Gift Homes), modelling the judicial process of statutory interpretation (Happy Families) and integrating both those processes in an examination context (Panic Stations).

The CASI project is mounted in Hypercard and has been undertaken by the author in collaboration with Maijan Lousberg, CBE consultant, Computing Services Centre, University of Otago.

Introduction: The Impetus

To teach 550 or more students anything, when there is one teacher, is to truly beg the question. To teach them in the context of a competitive entry program is to up the ante even more. The first year law class at the Faculty of Law, University of Otago, whether observed from the point of view of teacher or student, is an educational experience few New Zealand students will meet again. Of that intake, only 180 students will be able to enter the remaining three years of the Bachelor of Laws programme. For a student, whether he or she will survive the "weeding out" process is a constant source of anxiety. For the teacher, the consciousness of the sheer size of the class places real pressure on each lesson, in terms of its success in laying a foundation for a majority of the class upon which to build their legal process skills.

Three teachers work in the Legal System programme, each with a discrete area of substantive teaching responsibility: the study of legal history, the development of the process of case analysis and an introduction to the principles and practice of statutory application and interpretation. It was in the desire to reduce the level of discomfort in the statutory area (the first taught process) that the kernel of an idea for CASI began to grow.

The simple reality with such a large student catchment is that the range of linguistic and reasoning skills within the group is bewilderingly variable. The corollary is that the rate of individual acquisition of legal process skills is infinitely unpredictable. So very much depends upon the attributes each student already bears: their ability to study effectively, and their receptiveness to internalising the legal approaches to ordering reality which will define them as lawyers.

While that cocktail of personal characteristics clearly affects the takeup of new intellectual process, so too does the size and competitive nature of the class. Each student is offered a weekly small group class (of 12-14 students) as a supplement to the lecture programme. Nevertheless a proportion of students will fail to disclose their learning difficulties there, because of the underlying competitive environment, or will become excessively dependent on the collective skills of the class or small group in order to survive. Either way, they are unable to meet the examination demands of the course, or fail to achieve the level of achievement they desire.

For those students who adapt quickly and with a sense of exploration to the discipline of legal study, large classes are also limiting experiences. There is often little time to explore the tangential matters which may arouse their enquiry or provide more guided learning rather than the didactic model.

So the driving value which underpins the structure and delivery of each lecture seems often to be the provision of a sufficiently broad comfort zone which will cater for as many of the class as possible. While within each lecture class a variety of teaching techniques are employed, even a "successful" class will leave behind or fail to extend two identifiable sub-groups.

Casi - Setting The Challenge of Form

It is impossible for a single teacher to find a daily solution to the inevitable limitations inherent in the traditional lecture delivery ethic. And some would perhaps ask the question: why try? If the first year programme is attrition based, then a spread of demonstrated ability is the desired outcome. That may be quite true - however the law school operates upon the principle of open entry into the first year programme. That should mean a conscious attempt to cater for the learning differences inherent in the catchment attracted to the programme.

So CASI was invented as a concept, in order to explore whether the computer could offer an additional teaching resource. The word "teaching" is used deliberately here. If CASI aimed to do anything, it was to allow each student user to create a flexible teaching environment for themselves. It was envisaged that a user's decisions in terms of where he or she would travel across the navigation web of each program would chart the boundaries of the digital teaching domain on an individual basis. (The term 'navigation web' has no special technical meaning: it is used as an image to try and convey the underlying dynamic and, hopefully, the 'look and feel' of the CASI suite of programs.)

It was envisaged that a student who struggled to grapple with certain application and interpretation concepts could build an iterative web to spider across; a student with a higher comfort level could immerse themselves in random travel, concentrating on those aspects of the web which extended their thinking. Finally, the student who wished to use the web simply to rehearse their understanding of the domain within conventional limits could equally do so.

The fact of choice would also enable the concomitant responsibility for the success of the outcome to reside with the student. The desire to encourage students to own to that stems from the author's long standing exposure to full-text free search legal databases, such as LEXIS, KIWINET and QL/SEARCH. In teaching computer assisted legal retrieval (CALR) skills to the senior school, the author observed the excitement with which students approached the concept of using a computer to locate material obscured at times by the conventions of third party indexation. Even more heartening was their readiness to accept that their unique search statements influenced the success or otherwise of their electronic forays. If students welcomed the allied freedom and responsibility inherent in computerised legal retrieval, then that same receptiveness might be transported across to the world of computer based legal education.

The form of the CASI project (a series of flexible matrices, amenable to student navigation) was therefore the fundamental decision. It was prompted by the prospect of using a computer to meet a

teaching need and by an awareness (through exposure to CALR) of the liberating ability the computer can offer to navigate through ideas. It was also substantively driven by the author's desire to represent the process of statutory interpretation as reflected in its actual practice.

Application of a statute is linear in many ways, requiring the serial matching of the statutory elements to the legally relevant facts. But the interpretative aspect of the process (choosing the most appropriate meaning for ambiguous words) requires competing considerations to be simultaneously factored into the final assessment. It is an exercise in which a judge must balance textual, purposive and policy considerations with due regard to the constitutional position of both parliament and the courts. The non-linearity of the interpretative process which can arise as a result of the serial process of statutory application is so~ething which is explored in formal lectures (though ironically, in terms of oral delivery, can only be done in a linear fashion). It seemed that the digital environment could be one in which the "real" nature of the dynamic of the interpretative process could be mirrored by replicating the push-pull" effect of interpretative legal argument in a kinetic fashion, which the student could freely explore.

The author is aware that she may be buying into a philosophical debate about the nature of legal reasoning in stating her predominant objective for the flavour of the CASI experience. But it would be disingenuous to minimise the strength of the belief in the parallel nature of the interpretative process and how much it coloured the task of structuring the webs and writing the text of each program. (Even so, where linear exploration is demanded as a formal characteristic of the legal process being modelled (as it often is with statutory application), that need is faithfully represented by specifically advising the student navigator.)

CASI - Setting The Challenge of Content

The decision as to form did not solve the thorny question of how to build each digital web. The amorphous goals of student control and transparency of navigation were exciting in prospect -but on practical level, writing of each web would to be a serial process, in terms of laying out the domain for exploration and the text of each strand. The "quail" factor held sway for some time for the author who wondered if she were truly embarking upon a manageable enterprise.

Reading about the received advantages of CBE - privacy of learning, control of the rate of progress, self directed exploration, iterative approaches, opportunity for self assessment -fortified the decision to attempt to begin, particularly given the imperative of servicing the learning needs of such a large class. However it took some months before any methodology began to crystallise.

The reason for this was the author's geographical and collegial isolation from the world of computer based legal education:

- no legal academic in any of the five New Zealand law schools had, to the author's knowledge, begun to develop OBE products;
- the only colleague with whom the author had continuing contact on the development of CBE was from the Queensland University of Technology, Brisbane, Australia, which had developed its own large unit, producing in the DOS and Windows environments;
- the CBE unit at the University of Otago consists of one consultant who at any one time may be involved with up to 26 authors, in disciplines ranging from medicine to language learning to feminist studies;
- the University of Otago had made a strong commitment to the Apple computing environment on a university wide basis, with the inevitable result that the software to be used to build the CASI project was Macintosh Hypercard.

Shortly put, Hypercard provides a hypertext or hypermedia environment for storing and linking information. A user can browse on text ("field") on a screen ("card") and click on symbols

("buttons") which may take the user to another file or part of a file ("stack") or which may perform a particular action. (A short description of Hypercard is provided in <u>Appendix 1</u>.)

While the author was used to both DOS and Apple platforms as a software consumer, she had no programming experience in either environment. Therefore, the prospect of using Hypercard as the digital base for CASI seemed the obstacle to its proceeding beyond an acronym and an interesting educational idea. The belief that it was necessary to be both author and programmer - and that a learning curve on matters digital had to be successfully negotiated before work on matters legal could begin - was prompted by the perceived lack of human resources to provide assistance.

Marjan Lousberg, the CBE consultant, finally corrected this assumption, once the author owned to it. Her message was eminently simple: to forget about the software, its functionality or its technical limitations (which, with the benefit of hindsight, were very few). Concentration on what the author wished the student to be able to do within the web was the primary focus. How that was digitally achieved was a concern which properly lay outside the author's domain.

So CASI tentatively began to take shape in the digital world - initialty in the form of a set of word processing files for each program.

CASI - The Substantive Development

The physical resources with which to build CASI came down to one author with minimal knowledge of the Hypercard environment and one consultant/programmer with 10 hours of time per program. (This is the notional limit set by the consultant, within which to mount a viable 'stack'.) The project made no extra digital demands upon the Faculty of Law, since the purchase of extra hardware or software was unnecessary. Nor were the services of the programmer cost recoverable, as a matter of university CBE policy. (This is largely due to the influence of the consultant, who is of the view that CEE material will be generated more readily in a low cost developmental environment.)

Some Hypercard stack authors at the University of Otago had used its features and the image compression ability offered by Apple Macintosh Quicktime technology to turn slide collections or texts containing large amounts of graphics into CBE lessons. These developers quickly recycled existing teaching resources into a digital medium, making the material constantly available to students through the campus network, rather than restrictively displayed in lecture sessions.

The nature of CASI was to be quite different - to take an essentially text-driven discipline and somehow make it a kinetic and visual experience, without doing disservice to the nature of the process being represented. What it meant was a large element of novelty was necessary, yet at the same time that novelty had to support a valid teaching approach. The developmental process was essentially informal, given the small scale of the project and the isolated nature of the work. It is best detailed as a series of arachnidan images, consonant with the free-form flavour of the programs it sought to produce:

- parlour siting (setting the domain)
- mapping the web (stranding)
- wnting the web (spinning)
- spidering (debugging)

a) Parlour siting (setting the domain)

The first task was to choose different aspects of the statutory interpretation course as suitable domains for digital exploration. CASI now consists of three stand-alone modules, sample web maps of which are included in Appendix II:

GIFT HORSES replicates the process of creation, analysis and application of a statute. The web is made up of three interconnected strands:

- in 'Creation' a student user may explore the parliamentary process in the context of the legislative journey of the Unsolicited Goods and Services Act 1975, tracking the general parliamentary procedure, and the actual events which led to the creation of the statute.
- in 'Structure', a guide (in the form of a moving snail) draws the user through the text of the provisions, offering comment on both standard statutory structure and the logical function of commonly used words ("and", "or", notwithstanding" etc.). The guide becomes less directive as the student moves deeper the statute, and there is opportunity to self-test on aspects already met.
- in 'Application', a fact problem is presented and the student is given assistance in applying the provisions of the statute and predicting the legal outcome. The snail helper here attempts to convey an ordered model of the application process, expressing the prediction of the outcome in basic opinion form.

HAPPY FAMILIES provides exposure to both the theoretical and practical faces of statutory interpretation.

It attempts to model the interpretative process, based on a reported decision. In essence the judge is asked to rule whether a court has jurisdiction to grant a non-molestation order at the suit of a mother against her son, based on the proper meaning to be attributed to the words "a man and a woman who have been living together in the same household".

The web is again multi-stranded, encouraging the user to explore the history of the legal provision as well as its statutory context (both factors weighed by the judge). In addition, a legal file is provided show the factual context in which such orders are made. Lawyer guides present the opposing submissions of mother and son and the response to each by the appellate judge. The user may move at will between these on an issue by issue basis. The full text of the case is also resident and a user may jump either from each partyts submission on an issue or from the judicial response to the relevant part of the case. General comment on the approaches to interpretation is also included.

PANIC STATIONS models the examination process in which the student must demonstrate a synthesis of application and interpretative skills.

The web includes the opportunity for the student user to explore techniques of preparing for examinations, including study methods and stress control. (This aspect of the web will be detached and made available on the campus network for all students to access, as it is of general use.)

The student is then presented with a set of facts and statutory provisions and guided through the processes of:

- fact assimilation
- statutory deconstruction
- ascribing factual relevance
- stating of the issues
- isolating the interpretative problems
- rehearsing the available interpretative approaches
- predicting a tentative outcome.

An outline which the student may print and take away is the culmination of the process, hopefully providing a paradigm skeletal legal opinion.

The final strand of the web will contain full legal opinions of varying quality, across which the

student may scroll to pull up hypertext marking commentary. In this way it is intended to make the assessment process transparent, in order to encourage students to self-assess their own progress or isolate areas of vulnerability.

The subject matter of each module was grounded in a lecture or tutorial the class would undertake. Many students are still not computer literate at the beginning of their university career and it is this group which forms the majority of the first year law class. Given that the aim of CASI was to attempt to reduce the stress of an intensely competitive environment, it did not seem constructive to begin in the digital world with legal process experiences not available in the formal teaching environment.

The three modules have differing web structures, but do share the following common design features:

i) intuitive point and click navigation: a main index screen shows the basic topography of the module, upon which the user clicks to enter the web maps;

ii) a glossary, accessible at any point, with some terms being "grouped" so that an explanation string is activated simply by clicking on the word itself;

iii) access to any part of the web from any other part at any time: a 'jump' is initiated by returning to the main map or by clicking on the icon representing the desired destination ontheweb;

iv) Go Back function which returns the student explorer to the place from which he or she last "jumped" from one part of the web to another;

vi) Quit function available on every screen;

vii) a "shadow" function which enables the user to see where he or she has already travelled on the web: boxed entry points to parts of the web become shaded at the base, once entered for the first time;

viii) absence of any exit screen in the conventional sense: it is for the user to decide where to travel and when and where to leave the web.

b) **Mapping the web**

While the aim of CASI was to provide a flexible and non-linear route through the material, suited to the entry level of each user, that of course was the operating image. Clearly the planning and writing of the learning domain had to be linear, at least in its initial stages. A passing acquaintance with a backward chaining expert system made the device of using tree structures to plan the topography of the web seem appealing.

The main bole of the tree (sometimes consisting of three trunks) was built, together with the interweaving branches (subroutines) positioned at appropriate points. This may seem quite conventional in terms of lesson construction and it is not asserted to be otherwise. It was done to give coherence to the text which had to be presented to the programmer in manageable digital form. Equally it seemed the only way for the author to stay uncaptured by the web, while acting as its builder.

c) **Spinning the web**

Once the shape of each web was tentatively settled, the task of writing the text began. Web shape and content sometimes changed during writing, the author abandoning strands which might have

lengthened the program beyond sustainable limits, or collapsing strands together as substance or logic demanded. Experience of the range of achievement possible made the spinning of the strands laborious but immensely satisfying. For the first time, knowledge of learning outcomes garnered from marking loads of 500+ papers annually could be recycled into the class in some tangible way.

Within the text (provided in word processing format to the programmer) the author included the following:

- a description or illustration of the screen layout, font and type style;
- teaching text;
- suggested functionality: for example, where a student might be expected to move from one routine to another, where jumps were needed in order to work through an elected choice, what additional web sections needed to be available from each text screen.

This was intended to provide the consultant/programmer with a specific construction path to follow, in the hope of achieving a viable program within the time available. It was also to help her stay sane in terms of massaging the material into the Hypercard environment, remembering her approach was to encourage the author to disregard any theorefical constraints the software might present.

d) Spidering (debugging)

Once the text files were massaged into the Hypercard environment, the final developmental phase of "debugging" began. This term describes the author's "spidering" across the web in order to check whether its topography was able to be intuitively negotiated by an intrepid student explorer. Its use does not imply the presence of large numbers of faults in the program's functionality.

At the same time, the aesthetics of each screen were assessed and some editing of text took place, with the aim of having a maximum of 12 lines of text per screen. That has almost always been achieved, without doing disservice to the legal process being represented, becaus~ of the hypertext ability available on each text screen. Extra navigation tools or enhanced functionality at certain points were suggested to the programmer at this stage.

Much of the aesthetic and editing work was carried out by the author independently, armed with a developer's version of the software. Structural changes to the web itself were executed by the programmer. This work of fine tuning the web content and checking the integrity of its structures has taken half the time expended in the writing but, in the author's view, it has been worth the effort. The rise in quality and manipulativeness of the web as a result has more than repaid the "debug" sessions.

The CASI suite is almost ready to be launched on the campus network. The application (Gift Horses) and interpretation (Happy Families) modules are complete. The final module (Panic Stations: synthesising skills in an exam context) is almost all written, webbed and debugged. All that remains is to make the assessment process transparent by producing legal opinions which exhibit certain characteristics consonant with particular grades and allowing the student to mouse across the text and pick up hypertext marker-commentary.

What delays completion is the decision whether and how to build an alternative set of routines which will allow students to take an opinion, self assess its omissions and weaknesses and then model it into something they consider stronger in terms of application and interpretation techniques. Hypertext ability makes such a web aspect technically feasible; it is this kind of interactive teaching opportunity which the digital world makes hard to ignore. However if the writing will have the effect of extending the final program beyond the time limits a student may bring to bear on use, it may provide a new web to be strung at some point beside the others.

Conclusion

The use students will make of CASI is the *n* factor which will determine further enhancements to the project. Formally monitoring student use is something the author is reluctant to do; it may lead to further anxiety in a group whose competitive awareness is already palpable. CASI was intended to offer students the *option* of a digital teaching experience, not to create what may be seen as another mandatory course demand.

It may be most appropriate for an e-mail system to be attached to the CASI suite, so that students may provide anonymous feedback, and that this will have to suffice until the effect of digital teaching can be anecdotally tracked for a time. For that reason the author makes no claim to seeing CASI as demonstrably affecting the achievement curves in the class. In the same way as each program has no exit screen, because of the apparent free-form nature of the material held in the webs, so too the effect of having spidered across them may have to remain indeterminate as well.

There is a certain congruence in that - for if CASI has come anywhere close to approximating its goal of creating a digital teaching experience which fits the needs of each user, then that is how it must be. To attempt to quantify the experience begs the question again. And that is where this all began.

Acknowledgement

The author extends her thanks to -

Ian Wilson, Faculty of Law, Queensland University of Technology, for his patient sounding board services over the months of CASI's gestation.

Maijan Lousberg, CBE consultant, Computing Services Centre, University of Otago, without whose digital midwifery, CASI would have remained a gleam in the author's eye.

Professor Peter Skegg, immediate past Dean and Professor Stuart Anderson, present Dean, Faculty of Law, University of Otago, for not enquiring when and whether CASI would ever be born.

Legal System students (1987-1992) whose good-will and determination to know about legal process provided the embryo.

APPENDIX I: HYPERCARD *

Hypercard is a Macintosh application which offers a hypertext or hypermedia environment for storing and linking information. Hypercard contains a number of tools which allow the author to create files of information (called "stacks" or Stackware). Each screen of information ("cards't) can contain text ("fields") and/or graphics, and chunks of information can be linked with "buttons".

The tools available to the user are:

- a browsing tool for accessing information;
- a button tool, for creating links or actions;
- a field tool, for creating textual information;
- a set of painting tools for creating graphics.

Hypercard does not use the Macintosh environment in the fullest sense, because it does not allow overlapping windows. The user's view is limited to one screenful ("card") at a time, although a similar effect can be created by the use of hypertext popup "fields", which can overlay selected text.

The Hypercard system contains a programming language, Hypertalk, which enables the author to do more with the system than merely link chunks of information. Hypercard uses an object oriented paradigm. Stacks, cards, buttons and text fields are all called objects. Hypertalk code can be attached to each object, and Hypercard uses a hierarchical message system to activate such code.

Hypertalk is a full programming language. Pascal-like in its syntax, its code looks strikingly like ordinary English. It is an interpreted system which causes certain speed limitations. However, the language Hypertalk itself can be extended by linking in outside code modules. These code modules may be written in C or Pascal, compiled as a Macintosh resource, and attached to the resource fork of Hypercard, or of an individual stack. The name given to the resource becomes the name of the new Hypertalk command. This is one way the speed limitations of Hypertalk can be overcome.

The object oriented approach means that characteristics of a specific object, such as the way it looks, its position1 or its Hypertalk code, are properties attached to the object. This means that the object can be copied or "cut" (in the way that text can be cut in a word processor) and "pasted", while retaining all its properties. This makes it possible to create tools with Hypercard (such as stack templates or button templates) which another author can copy and use.

* (Thanks to Marjan Lousberg, CBE Consultant, University of Otago, for providing this description.)
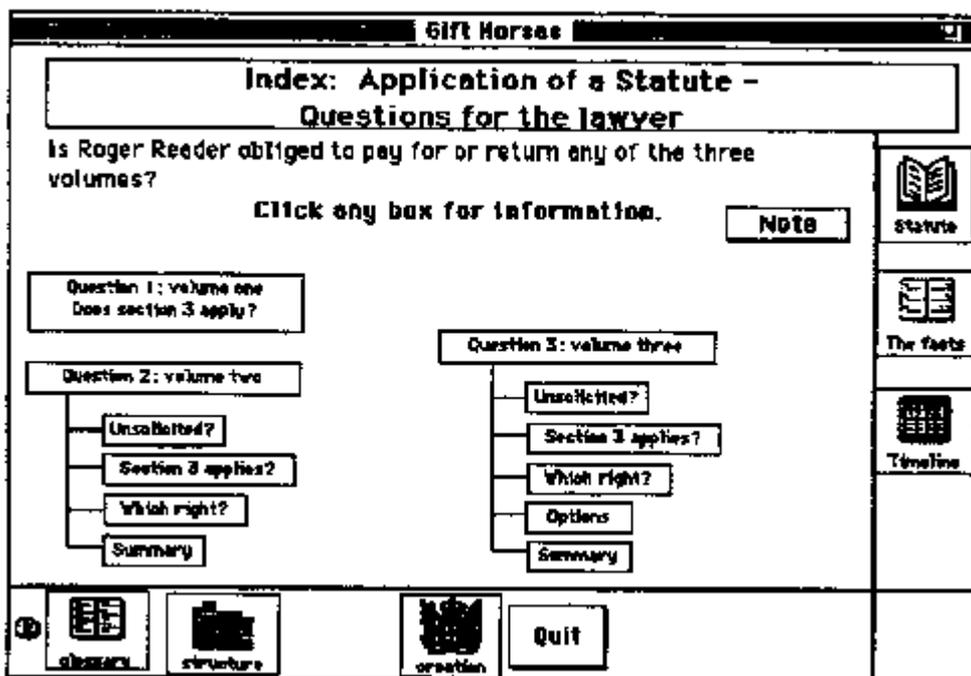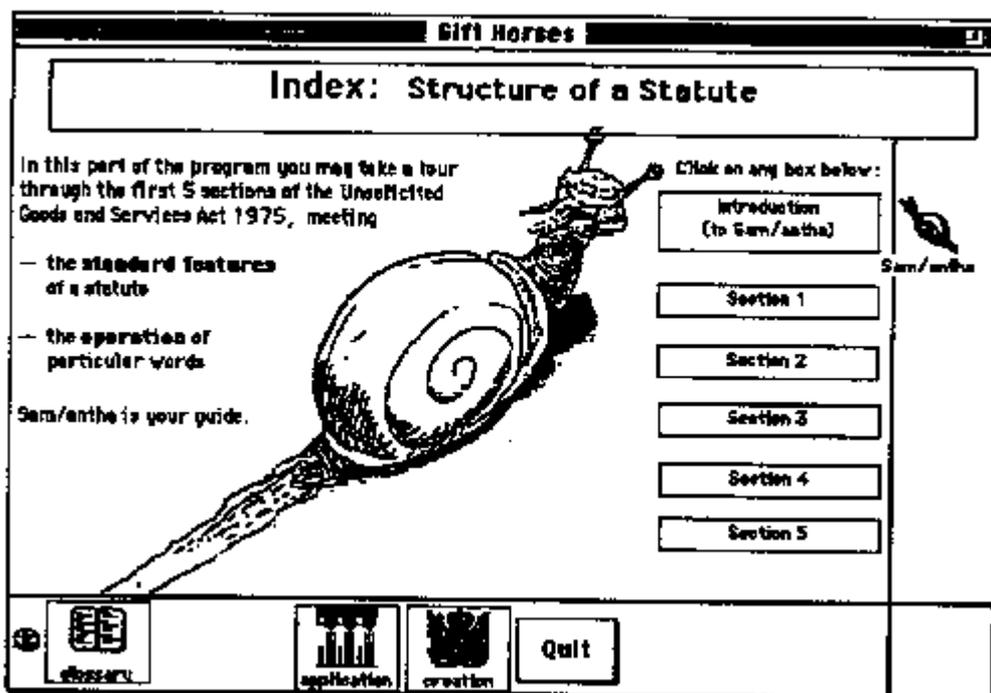
APPENDIX II

GIFT HORSES: (Creation, structure and application of a statute)

The main map of the web and the indices for Structure and Application are illustrated below:
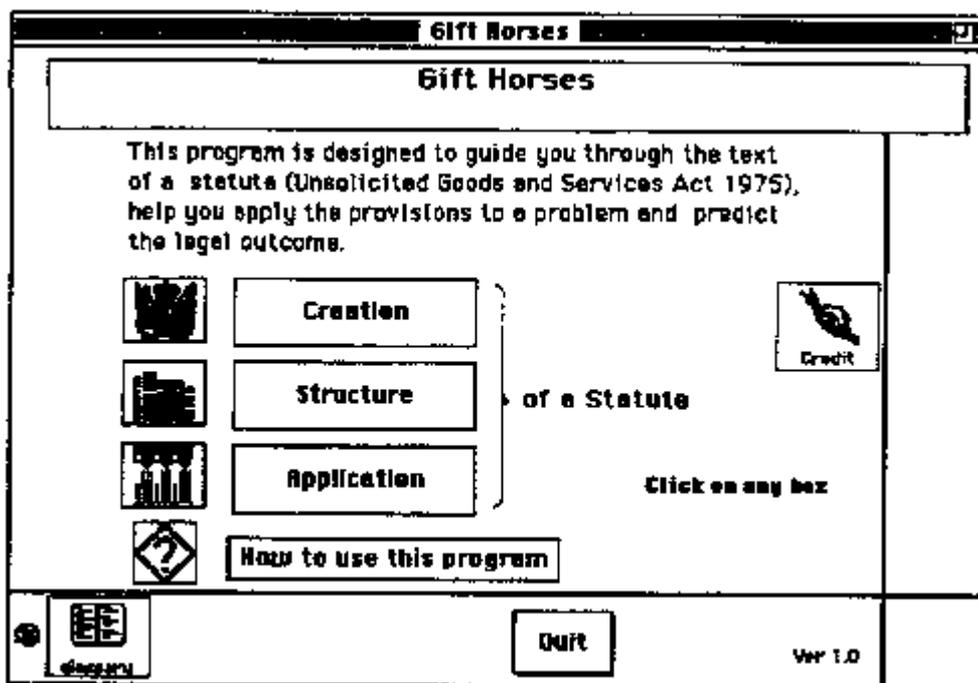
The student clicks on the icon for either Structure or Application and is then presented with the map of the part of the web requested:

HAPPY FAMILIES: (Modelling the process of statutory interpretation)

The composite web maps are included below, together with an example glossary screen:
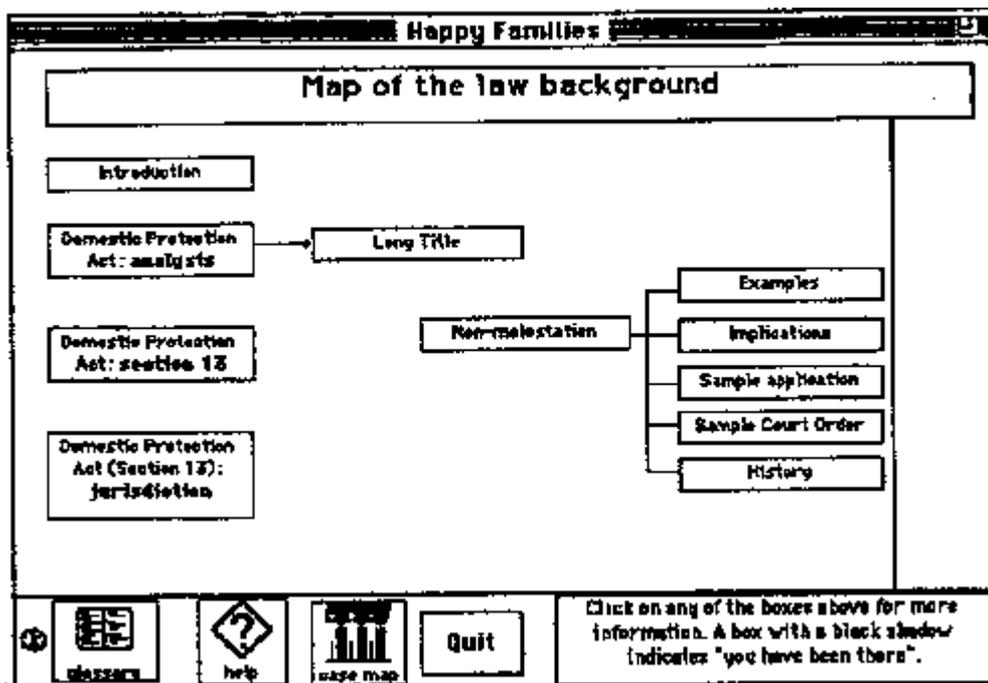
The student may elect to explore any area by clicking once on a box (which becomes shaded along its base line once entered, to enable the student to trade his or her navigation. Either map is accessible from any point on the other, by clicking on the icon in the bottom strip.

The 'help' icon takes the student to the screen of text included as a navigation aid to the web. It explains the point and click, jump and go back functions.

The glossary is always accessible, as is the Quit option. Below is an example of a glossary entry:

PANIC STATIONS: (Application and interpretation in an examination context.)

The main map of the web, together with the index screen for Examination, are illustrated below:

The use of visual analyses of statutory sections (a deconstruction device which students indicate they find helpful) is a feature of each program. Below is an example from Panic Stations:

The section concerns rights to seize or destroy an attacking dog. This screen illustrates the rights of an eyewitness; those of the owner or a police officer can be reviewed by clicking on the icons in the right hand strip.