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The Claims and Challenges of Computers in Learning the Law

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Abstract

Throughout its 30-year history, claims have been made for computers, computer assisted instruction (CAI) and more recently for communication and information technology (C&IT), as an educational tool, (Laurillard 1994), (Dearing 1997). It is not disputed that Computer Assisted Instruction has failed to meet these claims and has not attained its full potential. Initially simple challenges such as insufficient computers, or the difficulty of use, provided too many barriers to both teachers and students. These challenges have steadily reduced, technology is now readily available and accessible. Yet, as these challenges have been met new challenges within legal education have surfaced. Legal Education in the millennium has the following challenges;

* the focus encouraged by the RAE and SA (assisted by the creation of the LILI and the proposed Benchmark Standards).

* the desire to move from the rigid doctrinal teaching so enabling innovative curriculum reform and so widen the career opportunities for students (ACLEC, 1996), (Bradney 1995, 1997). (Countered by the demands of the professions, the stultifying requirements for a qualifying law degree (QLD) and the limitations imposed by the Foundation Degree proposals.)

* the need to encourage lifelong learning providing opportunities for continuing training in the law.

* the changing nature of the law and the operation of the legal system

* the dwindling of the traditional opportunities in the profession

* the pressure to continue to increase student numbers and

* the competition, both national and global through distant learning and internet based courses.

How will these challenges in legal education translate to the uses of the developing technologies? (Paliwala 1999) The paper will review the use of IOLIS within Liverpool JMU, and consider the extent to which the evolutionary approach adopted by IOLIS and the consequent developments although welcome may yet leave IOLIS wrong footed by the above challenges, (Jones and Scully 1996, 1998). It may be time to consider a more revolutionary approach to include the development of

suites of generic applications that can be taken and used by every academic, within the context of their own educational aims and objectives. It is a change from the provision of programs that direct a particular learning sequence to programs that manage the learning process, programs that are generic, that is they can be instantiated to the content and style of any user. Examples of programs that manage the learning process are already being developed and tested and include the development of simulation techniques (Widdison, Aikenhead, and Allen 1998) dialogic models of argumentation (Maharg 1998), (Bench-Capon and Staniford 1998) and the use development of programs using techniques from Artificial Intelligence (AI), (Hartley and Sleeman,1973), (Sleeman and Brown 1982).

Reviewing structures proposed by Jones and Van Wyke in 1987 (Jones, Van Wyke, 1987) (Aleven, V. and Ashley, K.D.1994), (Ashley, K., 1990), (Bench-Capon, T.J.M., Leng, P.H. and Staniford, G., 1998) ` the paper will consider in detail the possible us of the `new' AI techniques. It is considered by some that Artificial Intelligence is now in its `Spring' following the `Winter' of AI for most of the 1980's and 1990's. The new growth being encouraged by the need to manage the vast amounts of data generated by the WWW. The paper will consider whether techniques now adopted in AI will enable system to be developed that gives learners access to legal information and has the capability of understanding the needs of the user and adapting the presentation of the material accordingly.

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1. Computer Assisted Instruction (CAI)

CAI developed out of the programmed learning initiatives of the 1960's. The impetus for development sprang from the funded programmes of PLATO and TICCIT in the USA. Proponents of CAI made substantial claims for the technology. Yet the challenges in using the technology were to prove too great and by the later 1970's disenchantment with CAI had begun to settled over many educators and the funding agencies. CAI produced up to this time was see to be of little use, and some was even judged to be detrimental.

In 1982 a few far-sighted academics in the United States established the `Center for Computer Assisted Legal Instruction' (CCALI) at the Universities of Harvard and Minnesota. The title reflecting the contemporary view that education was primarily about instruction. Relying on private finance the `center', with the aid of an innovative (for 1982) authoring system based upon the PASCAL computer language, and with the co-operation of key academics, soon had a number of computer `lessons' available. Through a mix of private finance and subscriptions from law schools the `center' was able then to provide limited royalties for authors and to pump prime new lessons. Today CCALI has subscriptions from over 170 law schools mostly based in the USA and has more than 100 lessons available.

In the United Kingdom events were being driven by the Council of Europe who had in 1980 passed a resolution (80/37) recommending the integration of information technology in legal education. At a series of conferences arranged by the Council the idea of a national UK organisation was mooted, and the British and Irish Legal Educational Technology Association (BILETA) was born. The pattern was set for a series of co-operative projects in the United Kingdom, most nationally sponsored. Following BILETA came the Law Technology Centre established in 1987 and destined to be the model for other discipline adopted by the Computer Technology Initiative (CTI). Despite the national projects CAI continued to be a cottage industry with individuals developing CAI programs in the main for their own use and in their own subject areas. The CTI centre provided support through workshops and seminars and compiled a directory of legal software. In 1993 the Higher Education Funding Council provided over £11 million for 76 projects to develop software materials to support the university curriculum in the Teaching and Learning Technology Programme (TLTP). It aimed to establish discipline based consortia. A successful bid from the Law Technology Centre and BILETA and endorsed by the heads of law schools led to the establishment of the Law

Courseware Consortium (LCC) and to the development of the IOLIS authoring environment. The LCC has now employed nearly 70 authors to prepare over 70 electronic IOLIS workbooks covering around 40% of the typical undergraduate law degree in England and Wales (Moodie 1997, Scott and Widdison 1994, Widdison 1995). IOLIS also contains a hypertext resource book with full text of over 1,700 cases, statutes and articles relevant to the workbooks, a scrapbook facility and a facility to annotate pages to allow limited customisation of the materials (Paliwala 1998).

Subsequent funding initiatives have chosen not to build on the TLTP projects but to focus instead on teaching and learning generally, with a deliberate policy of not supporting computer assisted learning projects (HEFCE 1997). Funding from Development of Teaching and Learning (FDTL) led to National Centre for Legal Education (NCLE). Most recently the Institute for Learning and Teaching in Higher Education has been proposed by the Dearing committee (ILTHE).

2. Claims for Computer Assisted Learning

 In its infancy CAI was claimed to be able to democratise education, by delivering the same high quality education to all learners. Unlike its contemporary television CAI was claimed as having the ability to provide individual, self-paced and adaptive learning. CAI systems could within reason `pattern match' users responses giving the user a `feel' that the system was able to meet their individual needs. Instant feedback and correction could reinforce and correct, and if necessary links to other technologies could provide a richer learning environment. As with its predecessor programmed learning it was able to control subject flow but could unlike programmed learning allow sophisticated branching and have systems for the maintenance of student data. In common with television and programmed learning CAI was seen as means of reducing costs. The ability to increase access seemed obvious, the proliferation of networks would allow students to access CAI materials from any terminal point.

Despite the significant setbacks to the development and use of CAI the Dearing report (Dearing 1997) contained claims similar to those isolated in the 1970s and 1980s arguing that the innovative exploitation of Communications and Information Technology could improve the quality, flexibility and effectiveness of higher education, overcome the barriers that still exist to higher education and provide wider forms of access. As such CAI is seen as playing a significant role in the development of strategies for lifelong learning.

3. The Early Challenges for Computer Assisted Learning

 The early CCALI `lessons', and the small number of lessons produced in the UK, faced significant challenges to their development and in their use. The challenges fall into three broad categories. Those that acted against the production of good quality programs, those that created barriers to their use and those that prevented proper implementation and evaluation.

Initially the quality of the early CAI materials was either poor or perceived as poor. This was due to a number of factors that arose from a desire to use technology, no matter how limited, for technologies sake. Firstly as a cottage industry topic choice was largely based on the interests of the author, topics were chosen not because of they were appropriate to the technology but because they were topics in which the author had an interest or an expertise. In consequence there was a limited number of programs, providing only ad hoc coverage of law courses. Secondly the technology was very primitive, as a result the authoring systems provided limited facilities for testing techniques, students had difficulty knowing how well they were performing, systems allowed only limited control over program flow, programs were therefore not able to adapt to the needs of the user. Finally the technology could not link easily to other available information technology resources such as databases.

The second group of challenges were those barriers that naturally exist to the use of CAI materials.

Unlike the book, or programmed learning books that require little expertise, CAI required institutions to have adequate resources to access the programs. Staff were needed to install and run the programs, few law faculties had either the equipment or the support. The effect is that students were deflected from program use, they are naturally unwilling to devote time and effort to obtain a resource that is unreliable or unavailable. Added to this is the reluctance of tutors to use or recommend `other' peoples programs. Unlike text books where tutors are prepared, with reservations to use the texts of others and comment accordingly, computer programs are perceived as being more authoritative, less open to challenge or review. Whereas a text could be challenged, and students encouraged to question the conclusions, academics showed a marked reluctance to question the program, preferring to ignore them, not referring if staff disagreed or disliked their contents. Aggravating this was the endemic reluctance of university hierarchy and tutors to consider educational innovation as a topic worthy of consideration. The prizes in universities lay for those interested in research not education.

 The third challenge was a consequence of their being only a small quantity of CAI materials. The small number of programs, recognised as being individualistic, did not provide a sufficient body of material to allow a full review of their potential nor to examine mechanisms to embed them into the curriculum.

The Dearing report continued to echo these challenges agreeing that little or no progress had been made in the supervening decades. On the issue of quality there continues to be less satisfaction with CAI than with the traditional modes of teaching and learning. This is borne out by our own limited surveys. There continues to be a lack of thought as to why the technology is being used. Technology continues to drive, in its most recent form, the indiscriminate placing of `learning' materials on the World Wide Web (WWW), such materials do not provide a learning environment, providing information or better access to it does not necessarily promote learning.

Some challenges have however been met. Chief among these is the problem of resources. The first and second BILETA reports (BILETA 1991 and 1996) had laid down minimum requirements for technology in law schools. Many universities have invested substantially in technology and strategies are now being considered to widen access. Dearing suggests, and this does appear to be the strategy most likely to succeed, that students should own their computers with the university providing the necessary infrastructure allowing students to `plug into' resources. In addition technology has continued to become easier for the user, the use of Windows and similar Graphical User Interfaces (GUI) attempt to make computer uses more intuitive.

4. IOLIS in the New Education Market Place

 The funding provided by the TLTP project led to the establishment of the Law Courseware Consortium, this gave legal academics an opportunity to develop a significant body of CAI materials, materials that would avoid the defects that had hindered the earlier generation of computer programs. The development of these IOLIS programs has been well documented. (Scott and Widdison 1994, Widdison 1995, Moodie 1997)

The substantial TLTP funding enabled the consortium to begin to tackle the pedagogical challenges that had dogged the CAI materials from earlier generations. The funding enabled the consortium to establish a set of workbooks designed to provide coverage of the undergraduate core subjects. A process was developed of attracting subject teams and allowing the teams to develop the topics for the workbooks within their subject area. Authors were chosen both for their subject expertise and for their enthusiasm for the idea. "Reliance was placed on subject experts ahead of techno-lawyers" (Paliwala 1998). Such authors would bring a wide variety of approaches to the subject, therefore aiding the acceptance of the materials which no longer had such an individualist stamp. Workbooks providing differing forms of instruction in the subject. The scale of the available materials would in turn aid integration as surely from the mass of materials tutors would find some

materials that could be integrated into their courses. To further encourage tutors and students annotation of the materials is now possible thus allowing alternative (correct?) perspectives to be considered.

The design of the IOLIS system allowed for an infinite variety of interactions, indeed interaction forms were added as and when necessary at the behest of the author. This has effect of driving up quality. Multimedia facilities improve the richness of presentation, improved navigation tools allow users to move to particular sections, pages, sections, other workbooks or the resource book with ease. Hypertext linking allows greater flexibility for the user to follow materials through the workbook and into the resource book. The development of the resource book has increased the technology within the system and students can use scrapbook facilities to maintain records of interactions and resources.

Experience of the use of the materials is now beginning to inform on whether there are significant differences in the way law is taught or whether the different perspective and approaches has been overplayed and as Widdison (1995) suggests, "... may not the similarities between law schools be greater than the differences?"

The educational environment in which IOLIS now operates is one where the previous lack of status credited to work on education is being remedied. Lobbying through BILETA and Head of Law Schools has increased the status of education and teaching within law schools although even in this year of an RAE doubt still exists on the value that will be placed on publications relating to legal education and to authorship within IOLIS. Dearing has prompted this trend attempting to raise the profile of teaching through recommending the establishment of a national Institute of Learning and Teaching in Higher Education (Dearing Report 1997) The Institute is to become a major resource regarding the use procurement and development of CAI materials, the suggestion being that the Institute could develop a system for kite marking such materials co-ordinating managing the development of such materials, promoting their use and encouraging the development of common units for early undergraduate years.

Although progress is being made the road will be hard and long for in the Dearing Report it was stated that:

"The challenge of the next twenty years is to maintain the distinctiveness of learning at Higher Education level and to enhance teaching to improve student's learning."

(This could indeed be easily translated to apply specifically to legal education by merely inserting the word legal before distinctiveness of learning). It is probably true to say that this particular challenge has always existed. Most practitioners will verify that it is always a challenge to engage with students via teaching and thereby enhancing and contributing to their learning.

However the question that needs to be addressed is what now makes this challenge so imperative in the 21st Century? What specific factors are contributing to the possible demise of Higher Education teaching and indeed learning? It would appear that the fundamental challenge to Higher Education is not primarily the "craft" of educating but finance. This has been recognised by a number of eminent bodies but perhaps not least by the educationalists at the chalk face. The ACLEC report (ACLEC, 1996) stated:

"The most problematic and crucial of these developments is the future financing of higher and professional education."

The problem would appear to be that although there have been financial cut backs made in Higher Education this has not had the effect of reducing student numbers, indeed quite the opposite in that it would seem that student numbers are on the increase. Thus we as educationalists have the

"challenge" of dwindling finance but increasing student numbers and as Widdison and Schulte recognised how do we fit "quarts into pint pots?" (Widdison and Schulte, 1998)

Having to deal with large classes does however place a strain on conventional teaching and learning methods. For example at Liverpool John Moores University in some subjects, with particularly large classes, teaching "small group" tutorials has become impossible due to increases in class sizes. In order to deal with this problem tutorials/seminars have been replaced by a "workshop" approach. Students are encouraged to work in small groups within the workshop grouping. The tutor can then act as a facilitator rather than as a conventional tutorial tutor. The necessity for such changes in educational practise has been highlighted by Graham Gibb. Lecturers now need more than ever different teaching strategies to cope with changing class sizes. Indeed it has been said that now staff in Higher Education are no longer to be "the sage on the stage" but are to be "the guide on the side." (French, 1999)

A further challenge to Higher Education and therefore to legal education is the changing perceptions of the student body itself. It is probably true to say that the impact of the imposition of student fees onto the students themselves has made students much more demanding in that they perhaps now see themselves as being "consumers". As consumers they "want to see something for their money." Esoteric discussions on the inherent value of education might not be sufficient to their perceived needs. They want value for money and therefore would seem to expect at the very least, extensive course materials and support and at the most the use of high quality technology in the delivery of their education. The challenge to educators is being able to meet this demand. It would also appear that many students now enter Higher Education with many IT skills. Again the challenge to us as educators is to harness these skills and to make best use of them by exploiting such skills in the curriculum.

There remains a small but significant number of challenges to CAI, previously isolated, that have yet to be addressed. It is probable that these can be solved within the existing IOLIS framework, through a process of evolution and development of the system and through the inevitable developments in the capability of the technology.

Firstly is the issue of `barriers' to use. IOLIS, as with virtually ever other system used by law students is reliant on the keyboard and mouse, relatively primitive forms of communication and interaction, which in no way approach the richness of personal interactions. Systems of user ID and password still represent barriers to access. Despite improved availability of the technology and improved interfaces for some groups of students barriers are still there, foremost amongst these are the mature part-time students who in addition to lacking confidence in their ability to use the technology also have problems accessing the technology at their study time (Volland 1997). Initiatives to increase access to IOLIS through the sale to individuals, the new forms of integrated library and developments in user interfaces and voice recognition will all reduce these barriers.

Secondly the mere provision of such rich interactions and access does not of itself create an effective learning environment. It has been suggested that some thought should be given to training authors in the appropriate use of the hypertext systems in IOLIS (Jones and Scully 1996) and in the development of asynchronous communication systems and other techniques to encourage collaboration (Jones and Scully 1998). At present although IOLIS users are active learners, they are in the main solitary.

Finally there is the challenge to win over tutors and embed IOLIS into the law school curriculum. It is not sufficient merely to slot a well-designed on-line course into the existing course. We are looking for what Paliwala (1998) has called a `culture change'. It is to be regretted that a bid by the Law Courseware Consortium for stage 3 funding for implementation of IOLIS within law school curricula has been rejected. Work by the Law Technology Centre continues on implementation and others are beginning the process of evaluation of the body of material provided by the LCC.

5. A Snapshot of IOLIS Usage

Results of IOLIS usage are unlikely, therefore, at this stage to show a massive change in CAI usage. Feedback provided to the LCC from tutors and students is generally positive (Paliwala 1998). The emphasis of the following discussion is the review of the implementation of IOLIS in teaching and learning at Liverpool JMU, a project funded by the City Solicitors Trust Fund. The project has reviewed student and staff perceptions of IOLIS. For students the perceived barrier to further student use of IOLIS is the apparent under use, by staff, of IOLIS coupled with a general lack of appreciation as to the benefits and the multi purpose use that can be made of IOLIS.

In an attempt to gain further insights into student usage of IOLIS a questionnaire was distributed to Level Two students. Level two students were chosen for a variety of reasons, however, primarily they were chosen as they would hopefully have prior experience of IOLIS from level one and also Land Law 2 was hoped to be used as a vehicle for the further implementation of IOLIS.

The results have been interesting and useful in acting as a guide to the further implementation of IOLIS at Liverpool JMU. Out of a class of approximately 110 students, 73 students returned the questionnaires. This is seen as a good response and can perhaps be compared with the response made by staff to an equivalent questionnaire distributed to them. Out of 73 students only 17 did not know what IOLIS was. Of the students who knew of IOLIS 10 never used IOLIS, 5 always use IOLIS leaving the remaining 41 as occasional users, a total of 46. Of these 31 used IOLIS in research for tutorial work and in the preparation of assignments and 17 students use IOLIS for revision purposes. This later figure came as a surprise as it was thought that a higher percentage of students would use IOLIS for this purpose. When asked whether they were directed by staff to use IOLIS in preparation for tutorials and workshops 27 responded no, whilst 34 said they were sometimes directed, 3 said they were frequently directed to IOLIS by tutors and 9 did not respond to the question. Thus it would appear that just over half of the students were directed by staff to use IOLIS. We feel able to draw the following preliminary conclusions:

* Some students remain oblivious to IOLIS and its potential attributes.

* That although some students are aware of IOLIS they still do not make use of it.

* It would appear that most of the usage lies in research and hence the Resource Book

* That there is perhaps less use of the workbooks for revision purposes than we would have expected.

* That staff, sometimes encourage students to use IOLIS in the preparation for tutorials/workshops.

If the existing use of IOLIS is to be increased and further implementation of IOLIS is to be made in the areas of teaching and learning then the above issues will need to be addressed in the next stage of the project at Liverpool JMU.

Hopefully now that student usage has been identified then necessary measures can be taken to integrate the use of IOLIS more fully into the law curriculum.

IOLIS has a very mixed response from academic staff at Liverpool JMU ranging from the very enthusiastic to the not very enthusiastic, the majority ignoring IOLIS as a possible teaching and learning package. The onus appears to be on the students themselves to use IOLIS as and when they think it necessary rather than being directed to using it by members of staff. To ascertain the perceived shortfalls by lecturers of IOLIS a further questionnaire was distributed. Twenty- four questionnaires were distributed and eight returned. (This can perhaps be interpreted in a negative

way). Out of this small sample seven out of the eight knew what IOLIS was, three members of staff used IOLIS sometimes and one frequently. In answer to the question as to whether they directed students to use IOLIS in preparation for tutorials/workshops, four answered never, three sometimes and one frequently. Out of the staff who never directed students to the use of IOLIS one thought it not an appropriate tool for undergraduate students , two never thought about directing students to IOLIS and one thought that the subjects they taught were not covered by IOLIS. Four members of staff out of the eight would be interested in further training in the use of IOLIS.

The answers to these questions were not surprising indeed they are perhaps indicative of the perceived shortfalls of IOLIS culled from oral discussions with colleagues. At best it would appear that four members of staff out of twenty- four direct students to the use of IOLIS. At worst it would appear from the response to the questionnaire that members of staff see little use for IOLIS in teaching and learning. We will consider later why this may be. The challenge of increasing the use of IOLIS within teaching and learning at Liverpool JMU is to try and persuade academic staff of the advantages of IOLIS in terms of their own development as teachers and also in the development of student learning.

The emphasis of the IOLIS Implementation Project at Liverpool JMU is to attempt to make use of IOLIS as a teaching and learning tool. Once barriers have started to be eroded it is hoped that staff and students will be open to the positive contributions that IOLIS may make to the law curriculum.

An attempt has been made, although this in the early stages of development, of using IOLIS in various teaching and learning situations particularly in tutorials and lectures. Land Law 2 is being used as a vehicle for this development. The rationale for using Land Law 2 are twofold:

* This is a level two subject and therefore students have an awareness and experience of using IOLIS

* Land law is perceived as being a dry and boring subject and therefore the use of IOLIS may be of some practical use in overcoming some of these perceptions.

It is thought that IOLIS may be of particular use as a teaching and learning aid in the tutorial/workshop situation . To this end Land Law 2 tutorials were lengthened to enable students to work through set questions. These questions were written by a member of the Land Law 2 team the aim being to compliment certain IOLIS workbooks. However this has been met with a certain amount of resistance and lack of enthusiasm from some members of the team who latter expressed the fear that using IOLIS would distract students from the "real" work of undergraduate study. Thus highlighting the need for positive staff perceptions of the usefulness of IOLIS, if IOLIS is to be further integrated in to teaching and learning. It is obvious that further work needs to be done in order to raise staff perceptions of IOLIS. To a lesser extent the use of IOLIS has been encouraged in the teaching of level one students in Foundations (legal sources and skills). As part of workshop preparation students have been recommended to use certain workbooks . For example in the workshop on an Introduction to Human Rights students were asked to work through the : International Law: Human Rights Workbook. It is interesting to note that there has been a definite increase in the use of this workbook since this recommendation was made. On the 6th March 00, this workbook had been used 81 times, for a total of 12.46 hours in comparison to 9 users totalling 19 minutes. Thus a mere recommendation has increased use quite dramatically. (These figures do not take in to consideration the number of students who have purchased their own copy of IOLIS and thus the uptake of this recommendation will probably be higher than the figures indicate).

6. Changes in Legal Education, IOLIS and C&IT

In summary to major challenges facing legal education are;

* the focus encouraged by the RAE and SA (assisted by the creation of the LILI and the proposed Benchmark Standards).

* the desire to move from the rigid doctrinal teaching so enabling innovative curriculum reform and so widen the career opportunities for students (ACLEC, 1996), (Bradney 1995, 1997) Countered by the demands of the professions, the stultifying requirements for a qualifying law degree (QLD) and the limitations imposed by the Foundation Degree proposals.

* the need to encourage lifelong learning provides opportunities for continuing training in the law.

* the changing nature of the law and the operation of the legal system

* the dwindling of the traditional opportunities in the profession

* the pressure to continue to increase student numbers and

* the competition, both national and global through distant leaning and internet based courses.

Emphasis on the use of IT can be seen as part of a recognised general movement towards a push for transferable skills within Higher Education. It is seen that there are some skills that all students should possess, despite their discipline, and the obvious challenge to Higher Education generally and to legal education specifically, is to incorporate such skills within the teaching environment whilst at the same time maintaining academic integrity.

Such transferable skills encompass communication skills, problem solving, team work, autonomy, intellectual skills, numeracy and information technology skills. The Joint Statement of the Law Society and the General Council of the Bar (1999) recognised that certain transferable skills should be addressed in any course of study that both the Law Society and the Bar Council recognise. These transferable skills include:

* The ability to apply knowledge to complex situations,

* Research skills,

* The ability to use standard paper and electronic resources,

* The ability to produce word processed text and to present it in an appropriate form,

* The ability to conduct searches on web sites,

* To exchange documents by e-mail.

Emphasis has been placed on the use of IT in legal education, it is assumed through the development of these IT skills (NCLE, 1998) it will increase the broader employability of their students.

Would the Law Courseware Consortium have adopted its strategy if it had been able to foresee the changes to legal education that are now upon us. The original bid of the LCC was made in 1993, since that date there has been a number of substantial events in legal education including the ACLEC report (ACLEC 1996), an increase of interest in legal education (Bradney 1997) and the significant changes in higher education generally, modularistion, TQA, RAE and finally Dearing. To this add the increasing amount and availability of law and we now have what Bradney refers to as the "carnival that is legal education". Others have examined the implications of these events on legal education generally (Duncan 1997, Sherr 1998). This paper will content itself with considering these

effects on the development and use of CAI. How will changes in legal education effect the nature and use of technology and in particular the technology of CAI? CAI in law should aim to provide `effective legal education', what is `effective' legal education is changing, in consequence how can technology adapt and develop to meet the changes? Some changes can be accommodated relatively easily within the present system. CAI is well place to meet the changing demands for distance learning and lifelong learning, it was after all first considered as a way to provide individual tuition away from the university. The IOLIS system has, in addition, the capability within its multimedia facilities to assist in the teaching of skills (Jones et al 1995). There are however more fundamental changes that may wrong-foot legal CAI and the IOLIS system in particular. Some of these changes will require developments within the IOLIS structure, others may require a more radical approach. The first change is the move towards modularisation. In order to provide a breadth of coverage the LCC programme was designed to provide electronic workbooks in the seven core subjects. Modularisation had begun to expose the problem. Whilst providing coverage of the core many law schools do without the provision of the seven discrete subjects. The move towards modularisation, particularly developed at Liverpool JMU since 1990 has left the Liverpool JMU LL.B bereft of the core subjects in name. Contract, Tort and Equitable Remedies are lost in a series of modules entitled "Obligations 1, 2 and 3". The Law of the European Community is divided between Public 1, 2, 3. Criminal Law, Equity and Land Law are each divided into two separate modules. Although the IOLIS courseware is subject based, the design of each subject area into a number of workbooks means that students will be able to move between workbooks to find the relevant materials. Modularisation as such does not provide an insurmountable problem to the IOLIS structure, but does provide a small and annoying barrier to use. However a related yet separate move may be impossible to accommodate within the IOLIS structure, this is the move from doctrinal teaching, a move generated by increasing interest in teaching and learning, prompted in part from the ACLEC report. The consultation paper of the Lord Chancellor's Advisory Committee on Legal Education, (ACLEC), shows a coming together of the aims of legal education with those of higher education generally. ACLEC suggests four main aims for undergraduate legal education;

"to provide an understanding of the <u>fundamental principles and concepts</u> of English Law and the Law of the E.C., and develop the skills needed to solve legal problems

 to provide a rigorous theoretical and analytical education to enable students to develop a constructive and *critical approach* to the processes of law;

to enable students to see the law within its social, economic, political, historical, ethical and cultural context;

to inform by comparisons from other legal systems"

 There is a clear indication from the consultation paper of the need to encourage original and critical thought within the academic stage. Traditional doctrinal teaching does not facilitate deep learning, indeed it is diametrically opposed to this aim, looking at breadth not depth of understanding (Gibbs 1992). Commentators have in consequence concluded that,

"a deeper understanding of less will provide a more satisfactory learning experience" Duncan (1997).

Such propositions stand in contradiction to the need in C&IT to provide a breadth of material to allow integration and evaluation, the LCC bid was formed on this later premise.

The consultation paper states the problem and proffers in general terms the solution.

 "these functions cannot be carried out through learning dominated by passively absorbing or receiving knowledge. It requires an active process which promotes the general powers of the mind, and enables students not merely to know or know how to but to understand why things are as they

are and how they could be different and to relate ideas in one subject to those of others, to understand what they read, questioning material, making links, and pursuing lines of inquiry out of interest. " (Section 2.2)

Implicit in the requirements of deep learning is the ability for the learning environment to adapt to the learners style. The failure to adapt to the needs of the user is highlighted by Maharg, and earlier by Laurillard (pp3-4), teachers "need to know how individuals experience the subject." The learner is part of the environment and dynamically linked to it. The learner brings something of the environment, this is the learning style. That students learn in different ways is not disputed, what is disputed is the ways in which they learn. Pask (1975) identified two distinct groups of students who approached learning tasks differently. One group approached the information from a global viewpoint and taught it back to the examiner as if they had embodied the information into their own personal knowledge, they embrace theories and relate one to the other and then searching for examples and analogies which can be identified in the subject domain. This group may be referred to as having a comprehensive orientation or holistic learners. The other group approached the information in a serialistic fashion in that they learned the information piece by piece and taught it back in that manner, they use rule techniques and procedures in order to achieve understanding. They may be referred as having an operational orientation or serialistic learners. Tobias (1994) isolates four learner styles. By combining two ways of perceiving information (abstract and concrete) with the two ways in which information is ordered (sequential or random) she is able to derive the four learning styles of , the concrete sequentialist, the abstract sequentialist, the abstract randomist and the concrete randomist. Kolb (1984) classifies individuals as Accommodators (hands on), Divergers (contemplate), Assimilators (abstract) or Convergers (problem solving), with combinations of each. Duncan (1997) suggests that such learners may share similar ways of learning, and the use of Kolb's Learning Cycle provides a structure that accommodates these different learners.

With no obvious consensus on learning styles it would be unreasonable to expect any system to adapt to all styles. IOLIS workbook, as with other systems is however based on `a' learning style as determined by the author with no direct mechanism to adapt to the learning style of the user.

How will the demands in legal education translate to the uses of the developing technologies? It is suggested evolution will be sufficient (Paliwala 1999) For some, as evidence in the Liverpool JMU survey, C&IT can never be more than a complement to existing traditional teaching mechanisms. For these the strategic role of the teacher as motivator and guide cannot be replaced by the computer terminal (Migdale and Cartright 1998). IOLIS must avoid becoming a mere introduction to the material or acts as some electronic revision aid. Evolution is desirable and necessary..

The progress in legal C&IT in the 1990's has been possible because of the centralised projects based around the CTI and BILETA structures. To what extent can the IOLIS structure evolve? The LCC is structured to meet different needs. The LCC has overseen and enabled the development of a large suite of programs and has encouraged the involvement of a large number of academics. The IOLIS system has provided a uniform authoring and delivery system, providing a uniform interface to all programs. It has developed to include the integration of a number of useful tools within the system, it has enabled the integration of CAI with data base technology, it has introduced the concept of hypertext and began to lay the foundations for limited collaboration between users.

It has been suggested elsewhere (Jones and Scully 1998) that the present IOLIS system because of its single user base may encourage shallow learning.

"Decreasing the amount of `law' to be learnt and encouraging a move to non doctrinal law teaching may leave IOLIS and other such subject based systems wrong footed and unable to cope with radical changes predicted with higher education in the post `Dearing' market... It may be that IOLIS is not the correct vehicle for such developments, IOLIS was designed essentially as a single user activity

(Moodie 1997) and as such should not be expected to meet the requirements for collaborative learning... changes of similar scale would be needed to allow effective collaborative learning should IOLIS wish to develop its embryonic collaborative functions, a web based IOLIS would certainly benefit from such functionality. Such developments may be possible within the `home grown' IOLIS system, a system authored by the Law Courseware Consortium, should that direction be deemed appropriate by the consortium... The principles of effective collaborative learning must be explicitly woven into the software design and manipulation process for on-line learning. "

IOLIS's and other CAI programs weakness in the new educational environment, centre around three elements, its subject base, the imposed pedagogy and its limited provision for collaboration. The LCC framework is dependent upon a subject based structure, workbooks being grouped into the `core' subject areas. Each workbook is structured by its author who imposes their structure on it. There may be a wide variety of authoring styles, but only one within each workbook, the individual tutor and user takes that style given within that workbook. True the workbook may be used in a variety of ways, as general preparation or as revision or in some other more `integrated way' but this is not a system that has allowed "a thousand flowers have been allowed to bloom in authoring and use." (Paliwala 1998). The tutor has little opportunity to individualise the material, and for the user little opportunity to individualise the learning process. It is too early to consider whether the limited, findings of use at Liverpool JMU are evidence of these shortcomings but it is possible to speculate that the limited use of IOLIS may be in part due to these shortcomings. Staff and students need to `buy into' the particular methodology of a workbook, complimentary structures need to be established by the tutor, or work need needs to be done to tutorial questions to enable the workbook to fit within the approach of the particular institution. What cannot be overcome is the static nature of IOLIS, for example, a student studying Land Law might be directed by a tutor to work through the Workbook on Freehold Covenants. The student does quite well on her first attempt. She then decides to return to the Workbook after the tutorial on Freehold Covenants. However the student's understanding of the subject has increased whereas the Workbook remains exactly the same. It is a static tool unable to adapt to the student's changing level of knowledge and needs. There is as yet, no mechanism within IOLIS to meet these changing needs.

The single user base, the static subject content and single learning style makes it unsuited to the needs of the legal education environment where the trends will be towards less emphasis upon doctrinal learning, where there is encouragement to develop strategies that enable deep learning, and the culture is of distance and lifelong learning, in an education market that will respond to market conditions and which will demand innovation in learning.

IOLIS can and should evolve within the C&IT developments. Assessing the nature and form of technological developments is almost impossible, it is however reasonable to assume that trends will continue in a number of general areas. Firstly the WINDOWS interface has made the interaction with computers simpler, these Graphical User Interfaces (GUI) enable users to `see' more of what is happening with the system. The GUI will in part be replaced by easier forms of interaction such as voice recognition. Secondly applications will become less discrete, with seamless integration between different forms of programs, systems will operate on function with all the necessary programs operating to fulfil that function, this is already happening in new operating systems. Thirdly we will continue to develop expertise in the user of hypertext systems. Hypertext systems allow a user to move through material in the same way as you would using an encyclopaedia. Following particular words from one section to another. In the context of the WWW hypertext in the form of links enables users to move between different pages of information. Hypertext is in essence a simple idea, it has significant difficulties:n balancing the need to allow users to move as they wish, whilst not allowing them to be lost within the material. Suggestions have been made to develop an anchored system to prevent this. (Jones and Scully 1996). Fourthly networks, all UK universities are connected to the Internet via the academic network known as JANET. A high-speed broadband version of this network, SuperJANET, has been developed. It links universities and enables high-quality moving video to be networked for remote teaching and research purposes. It is reasonable to

expect that networks will continue to develop to enable increase amounts of data to pass, networks will become multistream, able to carry a vast array of varying forms of information, sound, video, and text these networks will become less reliant upon physical wire connections and radio and satellite networks will begin to replace them. The faculty and the student body will all have their own personal computers.

Yet even if IOLIS is found wanting it will have performed a remarkable task. The IOLIS initiative has acted as the `*Trojan Horse'*, for the thoughtful use of C&IT in the confines of the law school. Whilst some technology has already infiltrated, law schools, word processors, spreadsheets and networks, programs of the type of IOLIS had not. IOLIS programs are qualitatively different from these standard applications, they are specific, active and requiring constant updating. They are viewed significantly differently and with more suspicion by users (Paliwala et al 1992). IOLIS is in the law school and will provide the foundation for the new generation of legal C&IT materials.

7. The Use of Artificial Intelligence

One development as yet to make a significant impact on CAI will be the use of Artificial Intelligence (AI) techniques. There are already systems in operation that claim an element of intelligence, it may be that they can be adapted to be used with CAI.

Legal education will require that CAI materials will need to be adaptive to the needs of the tutor and of the learner, facilitate deep not shallow learning , be more useable, and provide transparent links to networks. Systems will need to facilitate skills development and non-doctrinal approaches to the study of law. To do this they will need to consider the developments in technology that will facilitate this. New technology twinned with the existence of the LCC and the IOLIS system could, I submit, be developed to accommodate these challenges. Through a process of evolution the `*Trojan Horse'* of IOLIS could undergo evolutionary and revolutionary changes within the law school. I propose to continue to shift the centre of gravity of CAI programs from the present emphasis on the interactive elements, in the case of IOLIS the electronic workbook, to the resource elements, in IOLIS the resource book, the a place where learning can take place. This shift could be continued to enhance the use of hypertext by providing an anchored hypertext system, that linked both IOLIS and external legal resources, alongside the improvement in the communicative elements of the system to encourage formal collaboration between users. (Jones and Scully 1996 and 1998).

 This will however satisfy only some of the challenges. The revolutionary change should include the development of suites of generic applications that can be taken and used by every academic, within the context of their own educational aims and objectives. Enabling IOLIS to meet the wide variety of demand and forms of legal education, to move it from its subject base, and its uniform pedagogy. This third stage is strategically different in that is does not involve mere evolutionary development of the system but a revolutionary approach to meet the challenges of a move from a subject learning experience. It is a change from the provision of programs that direct a particular learning sequence to programs that manage the learning process, programs that are generic, that is they can be instantiated to the content and style of any user. Examples of programs that mange the learning process are already being developed and tested and include the development of simulation techniques (Widdison et al 1998), dialogic models of argumentation (Blackie and Maharg 1998 Dublin), and the use development of programs using techniques from Artificial Intelligence (AI). (Jones 1987, Ashley 1998 and Wright 1998).

The move from `dumb' to `smart' to `intelligent' C&ITI systems will enable technology provide for the new needs of legal education. The majority of the existing systems used, including IOLIS are `dumb' systems. `Dumb' systems have a number of characteristics. Firstly they have no knowledge of the function that they are performing, IOLIS a word processor or a database has no `knowledge ` that it is dealing with legal material, it could be dealing with anything. Secondly the programs are data depend, that is in the case of IOLIS what is being taught is linked to how it is to be taught, in the

IOLIS workbook a particular subject is presented in a particular way, this may be (in the authors view) the appropriate way to present this material, there may be other ways to present the material. As the system is ignorant of the material it cannot present it in another way, the algorithm is inflexible Thirdly the existing systems manipulates its responses according to the data provided by student not by the knowledge of the student. The system attempts to second guess the knowledge of the student through the student responses, this guess may or may not be correct, if incorrect the student is de-motivated by the inappropriate response.

The move to `smart' and `intelligent systems involves differing program structures. They do not rely upon inflexible algorithms or structures. In the main they aim to operate independent of data. The use of AI techniques enables CAI systems to be generic, that is the system provides the non-data elements of the learning environment, into which the tutor places the specific topics and strategies and learner places their own learner style. Three groups of such generic systems could be developed. The first are systems that can hold and manipulate legal knowledge. The development of legal expert systems (Susskind 1986, Bench-Capon 1991) has generated a considerable literature of the representation of legal knowledge. Generic systems could allow legal information to be represented in differing forms, allowing alternative forms of analysis. The second group of systems would provide generic argument systems that can deal with differing argument strategies. (Aleven and Ashley 1994, Gordon 1995, Bench-Capon et al 1998) Such systems provide a structure for an argument dialogue between student and student or student and system. By varying the structure of the control mechanism tutors can encourage differing argument strategies.

The third group of systems would provide mechanisms to model student learning styles. CAI needs to be adaptive to the needs of the learner, existing systems have no knowledge of the learner nor their learning styles. The solution then is not to pre-empt the style of the user but to allow the user to impose their style on the system, or to put it another way, allow to system to learn the student style. The concept of the student model is to provide mechanisms whereby the system can build up a picture of the particular user. Through a series of interactions the system attempts to judge not only the understanding of the user and those strategies favoured by the user, then adapting the presentation of the material accordingly. The result is that the running of a CAI program will vary considerably from one user to another, the material presented will differ depending upon the knowledge of the user, the interactions varying according to the users learning style, (Anderson, et al 1985, Hartley and Sleeman 1973, Sleeman 1982). The role of the tutor is to choose the material and if they wish to impose appropriate learning strategies upon it. In the same way that a system is able to model the student it can model the tutor, by instruction the system can hold the various forms of teaching that are appropriate to particular subjects.

The revolution then is rather than providing a complete `take it or leave it' system the LCC would provide tutors with, access to legal information, the ability to represent that information in the way the tutor felt appropriate. This could then be made available for the learner either as an individual program with which the student works or as program that manages the interactions of a number of students. The program would have the capability of understanding the needs of the user and adapting the presentation of the material accordingly, with parameters set by the tutor.

Conclusion

 The LCC and its `*Trojan Horse'* IOLIS provides an opportunity to meet the challenges of legal education. By a mixture of evolution and revolution, initiating a move from a take it or leave it suite of programs to systems facilitates the management of the learning environment the LCC could provide tools that are sufficiently adaptable for the needs of the future of legal education, a future where no one form will prevail, but where the demands will be the same.

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