CITSCAPES Project Case Study Report

The University of Glasgow

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Executive Summary

The University of Glasgow was founded in 1451, and is one of the four "ancient" Scottish universities. It is the largest university in Scotland, with, in 2000-2001, 16,847 full-time and 2,459 part-time students divided between nine faculties. Glasgow has established itself as a university serving the West of Scotland, but it has also built up an international reputation which draws students from throughout the world. As an old university, Glasgow has a traditional structure, with a Senate supervising academic matters and a Court administrative ones. The University Principal is influential in both bodies, but normally requires the support of faculties in carrying matters through the Senate.

The University made a clear commitment to supporting an IT-rich student learning environment in its 1992 IT Strategy, which presented a clear vision of the well-supported IT-empowered student of the 1990s, and set out a range of measures to bring this vision to reality, including a "University-wide Introductory Course in IT". The University is now in the process of developing an Information Strategy which will maintain the commitment to an IT-rich learning environment. This vision evolves, and consideration is now being given to university-wide adoption of a Virtual Learning Environment.

The University has had, since 1994, a centrally-funded programme to deliver student IT literacy. Passing through the programme has been since 1999 a requirement for all students in the first year of study (c. 5,200 p.a.). The programme is built around an "IT Baseline", and a series of routes enables students to achieve the baseline competences; these include taught courses, a one-off test for those who already possess the skills, and an exemption procedure for those who already have proof of their skills or are receiving them through courses within their subject courses. The programme is run by the IT Education Unit (ITEU), which also offers non-compulsory courses beyond the baseline, focused on common student tasks. ITEU operates in close co-operation with subject departments. For post-graduate students, there are also courses offered by the University Computing Service, focused mainly on specific applications.

For the future, a number of developments are anticipated. This year ITEU launched an on-line element of the student IT Literacy Programme, offering a needs analysis procedure and linked registration system, a course delivery system and a set of feedback questionnaires. Further attention is now being focused on course provision beyond the IT Baseline, with a more developed structure aimed at preparing students for more advanced academic work and for passage into employment. As the university's choice of Virtual Learning Environment is made, IT Literacy provision will evolve to ensure that students are prepared for confident use of its full range of facilities.

The University is fully committed to maintaining its leading position as a provider, not only of student IT literacy, but of an IT environment in which students and staff can deploy the tools of the Information Age in the interests of learning. An IT guide issued to students makes this point: "IT is an important tool which can be employed to make study more effective. For this reason a programme of courses offering general IT competence to all students has been developed . … The courses making up the programme are open to all students …, and are free of change." (*IT for Effective Study*, 2001-2002 edition p. 21)

Methodological Note

This report has been prepared as a "self-completion" case study, i.e. an account by a participant of developments at his/her own institution. Such an account will be based upon documentation and personal knowledge, rather than on the more objective case study techniques employed by CITSCAPES research staff which have led to the production of case study reports on Glasgow Caledonian University, the University of Gloucestershire, and the Universities of Stirling and Oxford.

The Author

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1. Introduction: the University in Context

In 1451 James II, King of Scots, persuaded Pope Nicholas V to issue a bull authorising Bishop Turnbull of Glasgow to set up a university. Modelled on the University of Bologna, Glasgow was Scotland's second university, and is one of the four "ancient" Scottish universities (the others are St. Andrew's, Aberdeen and Edinburgh). For its first two centuries the university operated from Glasgow Cathedral and temporary accommodation nearby; in the seventeenth century it moved to its first permanent home in a building on the High Street, subsequently known as the "Old College" and described by contemporaries as "the chief ornament of the city". The University played an important part in the Scottish Enlightenment and in preparing the way for the Industrial Revolution. In the nineteenth century the Old College was bought by a railway company, and the University moved out to its present site in what was then suburban Gilmorehill in 1870. The Gilmorehill campus expanded considerably in subsequent years, and another campus for veterinary studies opened at the Garscube estate, to the north west of the city. In October 1999 a satellite campus was opened at the Crichton Hospital site in Dumfries. (http://www.gla.ac.uk/general/welcome/past_present.html)

The range of faculties, and numbers of current students are shown in Figure 1. 57.5% of students are women, 11% of students are from outwith the UK, and 12.5% of undergraduates are mature students (over 21 when they began their studies).

Faculty	**Undergraduate**		**Postgraduate**	
	full-time	**part-time**	**full-time**	**part-time**
Arts	3,880	130	201	118
Divinity	89	11	35	20
Education	522	2	304	828
Engineering	1,272	23	200	41
Law & Financial Studies	1,110	14	196	123
Medicine	1,775	40	229	383
Science	4,155	133	601	54
Social Sciences	1,442	44	214	373
Vet Medicine	458	5	73	12
Crichton Campus	91	105	-	-
Total	**14,794**	**507**	**2,053**	**1,952**

Figure 1. Student numbers, Glasgow University, session 2000-2001

(Figures do not include Department of Adult & Continuing Education students and students studying off-campus. From: http://www.gla.ac.uk/publications/factsandfigures/studentnumbers.html)

Higher education in Scotland has developed for centuries on a model of local provision, to which Glasgow is no exception: the majority of students is recruited from the west of Scotland, and large numbers live at home.

The University perceives itself as having more than local status, as one of the world's older universities. Its mission is

> to be a major research-led university operating in an international context with the following fundamental aims:
> - to provide education through the development of learning in a research environment
> - to undertake fundamental, strategic and applied research

- to sustain and add value to Scottish culture, to the natural environment and to the national economy. (http://www.gla.ac.uk/general/index.html)

In keeping with its perception of itself, the University is a member of the Russell Group of universities who regard themselves as the top layer of British universities. Glasgow is also a member of **Universitas 21**, described as "an international association of research-based universities committed to working together to enhance their status and capabilities." (*University of Glasgow Newsletter*, 31 May 2001, page 2) Among the Scottish universities, in most statistical comparisons Glasgow and Edinburgh stand well clear of the others, with Glasgow just ahead of Edinburgh on FTE student numbers and teaching income, but Edinburgh ahead of Glasgow on research income; this last comparison is a source of disappointment and a constant stimulus to try to do better (figures from http://www.shefc.ac.uk/publicat/statistics/Publications/Facts&Figures/FactsIntro.htm)

As an old university, Glasgow possesses a traditional structure of governance, with a central administration led by the Principal, and semi-autonomous faculties. The chief representative bodies are the Senate, representing the faculties, which supervises academic matters, and the Court, with administration, staff, graduate and lay representatives which supervises all other matters. In common with most older British universities, the autonomy of faculties has been eroded over the past thirty years as tighter financial regulation and accountability procedures have led to increasingly centralised control and disposition of resources. However, in contrast to the openly hierarchical managerial model of many post-1992 universities, the faculties do exert a certain countervailing power to that of the central administration, and the administration is generally obliged to seek consensus for major new developments. The University Principal is influential in both Court and Senate, but normally requires the support of faculties in carrying matters through the Senate (although on occasions of urgency opposition can be overriden). However, because of his role in resource distribution and liaison with the Funding Council, his role as determinator of policy has grown over recent decades.

Most undergraduates study for a 4-year first degree. In the Arts and Social Science faculties this is the MA degree dating from the university's foundation; the Scottish universities offering an MA as a first degree are under some pressure from the QAA to remove this "anomaly" but so far have resisted. In the "academic" faculties (Arts, Social Science, Science) students generally study a range of subjects for the first two years, focusing on their chosen area for the two years of honours study. Those not achieving grades enabling them to proceed to Honours take a final year to complete a non-honours degree in three years. In the "professional" faculties, subject choice is more restricted and students follow a more prescribed, occupationally-focused course, which will gain recognition for entry to the appropriate profession. Glasgow is regarded as a prestigious source of professional education, and entry into professional courses is generally highly competitive, with Veterinary Medicine probably the most difficult course in the university to enter.

2. Development of the IT Literacy Programme

The University of Glasgow is an example of how a relatively clear strategic route has been chosen, yet much complexity still remains. During the 1980s a variety of ad hoc developments appeared across the University, with provision of IT Literacy emerging in some departments. For instance, the university's history departments had made significant early progress: the DISH project was established in 1985 with CTI funding, and was involved in both provision of student access to computers, introductory courses and CAL development (Trainor, 1986, 1988). Some other departments developed their own introductory computer courses. These were usually focused on requirements of teaching, and often limited to the hardware and software used within the department; sometimes the aim was to merely to give students access to CAL programs. There was no uniformity in content of training, matching the variety of operating systems and software available on departmental computer labs. Training varied from casual and ad hoc instruction by postgraduate students as and when required to more fully developed courses taught by lecturers. In many other departments, however, there was little or no development of student IT preparation.

However, by the early 1990s the University had become aware of the need to develop an IT Strategy, and the Strategy document appeared at the end of 1992 (ITSC, 1992). It began by offering a vision for the future, presented as a description of what an IT-rich university of the near future might look like, and then developed a co-ordinated and comprehensive set of strategic imperatives to make the vision become a reality. The provision of IT skills for students was an integral part of the strategy: "The University should provide introductory courses in the use of information technology. Such courses would initially be voluntary but would soon become mandatory in some disciplines and for all postgraduates. A typical course might require 20 contact hours, predominantly doing rather than listening, and lead to a certificate of proficiency." (ITSC, 1992: 40-41) This course was intended to provide generic IT skills and awarenesses which would enable students to make the most of the IT facilities whose development was envisaged in the strategy document, to be appropriately equipped for IT-related activities within their departments, and in addition, to be well-prepared for entry to employment. Funding from central university resources was provided for a three-year trial of the course.

The IT literacy programme was launched in the academic year 1994-95 under the title *Making Good Use of IT* (this name has since been superseded by the more prosaic *Student IT Induction Programme* and then the *Student IT Literacy Programme*) and run by the university's IT Office, a central agency distinct from the University Computing Service. The other main function of the IT Office was developing and monitoring the IT Strategy, and the Head of the Office was Dr Peter Kemp, seconded from his post as Director of the University Computing Service to lead the implementation of the IT Strategy. The IT Office has since shed its strategic function and evolved into the IT Education Unit, which has itself also diversified into other IT Literacy/training related activities. Allan Martin was appointed to develop the programme.

The character of the programme was soon established. It had originally been based, during experimental activity in 1993-94, on a fragmented model of short (4-hour) courses, taught for two hours by a tutor and supervised for two hours by a demonstrator, a set of which had

to be taken to gain a certificate. However, from summer 1994 this model was superseded by an integrated model offering beginners a 12-hour hands-on course, taught fully throughout by a single tutor, integrating the applications which had previously been taught as separate small units. This arrangement enabled the course to be focused on student needs rather than computer applications; applications could be introduced in an integrated way, emphasising similar features and transferability of data, and their relevance to study tasks. The topics covered were using a graphical user interface, electronic mail, word-processing, file management, accessing data on the World Wide Web, and using the university library on-line catalogue. Employing a single tutor enabled the rapport to develop between tutor and students which gave students a greater degree of confidence; this was particularly important in a course targeted at those students with no prior IT skills. Courses from the programme could be applied for by students on an individual basis, or be commissioned by departments to offer to particular student cohorts. Courses were not customised for particular departments: each student got the same course, although the exercises included allowed students to focus on their own subjects of study.

In the following year (1997-98) the course programme structure was revised to focus on the concept of the *IT Baseline*, a set of generic IT competences and awarenesses set as an expectation for all students to achieve across the university. Students could reach the Baseline by taking one of three routes: the *Basic IT Course*, the 12-hour taught course starting from an assumption of little or no IT experience, the *IT Orientation Course*, a 6-hour course for those with some IT experience (assuming familiarity with a graphical user interface such as *Windows* and with word-processing), and the *Assessment-only* route, for those who feel they have already reached the Baseline. Achievement of the Baseline was marked by the award of a Certificate of Basic IT Competence. Beyond the Baseline were a number of *further units*, 4-hour courses focusing on particular applications or study tasks, such as spreadsheets, document design, preparing a CV, library search skills, preparing OHP slides and laying out a dissertation. Success in these was recorded on a Certificate of Further IT Competence, which the student would collect on leaving the university.

Year	Registrations
1994-95	702
1995-96	2857
1996-97	4002
1997-98	4245
1998-99	4997
1999-2000	5226
2000-2001	5657

Figure 2. Registrations on the IT Literacy Programme, 1994-2001

Numbers on the programme have grown continuously since its establishment, as shown in Figure 2. It was achieved, up to 1997-98, by voluntary entry to the programme by individual students or departments and faculties. The professionally-oriented faculties and departments (Medicine, Dentistry, Veterinary Medicine, Law, Accounting, Engineering) were generally quick to see the benefits, and to arrange for their first-year students to take courses, in most cases making successful completion of the course a requirement for progress into second year. In the Arts faculty, no such group arrangements could be made, but students were encouraged to take the course individually, and successful completion made a requirement for entry into some Honours courses. In Social Science, the Faculty was supportive, and made available time in faculty computer clusters for the delivery of

courses. In the Science Faculty, the decision made in 1996 that all 800-plus Level 1 Biology students should take the IT programme was a major advance.

The most significant change in the status of the programme was its becoming compulsory across the university. At its meeting of May 1998, the Senate approved the proposal that the Certificate of Basic IT Competence should be a requirement of graduation for undergraduates joining the university from academic year 1998-99 on. At its June 1998 meeting, amendments to degree regulations were approved which made possession of the Certificate a requirement of progress from first to second year for full-time undergraduate courses, and, from the academic year 1999-2000 the requirement was extended to postgraduate students. It is noteworthy that at neither Senate meeting was any objection raised to the establishment of the IT programme on a universal compulsory basis. However, by the time this happened, three-quarters of all first year students were passing through the programme, and it was already a compulsory requirement in many departments. Nevertheless, the transition to a compulsory system was not unproblematic, and involved a number of major changes in organisation and procedure:

i. Since the Certificate is regarded by the Registry as a university course module, although non-credit-bearing, submission of results at fixed points is required. Changes in organisation and procedure were initiated to enable this to take place.

ii. Regulations governing the award the IT Certificate were approved by the Education Committee of the University and then by the Senate.

iii. A system of exemptions was introduced, to ensure that only students requiring an ITEU course should be obliged to take one. Exemptions can be gained by providing documentary evidence of having already attained the IT Baseline, by passing another course module at the university whose syllabus covers all the Baseline competences, or (for students with a *prima facie* case for exemption, e.g. having prior experience of IT usage in a professional context) by passing a short test of IT competence.

iv. An IT Test was introduced which enabled those already feeling that they possessed the Baseline Skills to demonstrate this in practice, without having to take a course.

v. Procedures and documentation were upgraded to enable rapid identification of students who have problems completing an IT course.

vi. Plans were made for development of online course provision, so that an online course would be available for those already having some IT skill, and in addition, self-study "top-up" modules would be developed for those who gained partial exemption, with only one element of the course to complete.

vi. Structures will be developed to enable students on part-time and distance-learning courses to gain access to ITEU courses.

3. The Nature of Current Provision

The main features of the Glasgow IT Literacy Programme are outlined below.

3.1. A Defined Threshold: the "IT Baseline"

The programme is built around the notion of a minimum IT competency expectation for all students. The Baseline for 2002-2003 consists of the following elements:

Log on and off a network
Familiarity with a graphical user interface
Essential file management
Use of electronic mail
Basic word processing
Insertion of non-text objects into documents
Use of on-line library facilities
Location, retrieval and evaluation of on-line resources
Basic use of a spreadsheet
Integration of IT applications
Use of help systems and documentation
Consideration of appropriate use of IT facilities
Adoption of a responsible approach to use of IT facilities
Reflection on personal development as an IT user

The Baseline is based on a notion of what all students in higher education might require, no matter what their subject of study. Clearly not all the features will be used by everybody, however the Baseline has been developed by the IT Education Unit on a basis of consensus, and students and staff accept that a certain degree of standardisation is necessary to achieve cost-effectiveness of the programme. It is important to note here that the IT Literacy Programme is limited to generic IT applications only, and that the role of offering subject-specific IT-based tasks is entirely that of subject departments. The IT Baseline is then concerned only with generic basic competence.

The Baseline and full details of the IT Literacy Programme are published in a booklet *IT for Effective Study* which is issued to all new students when they matriculate (register) and is widely available to all other students. This booklet, which is updated annually, contains, in addition to details of the IT Literacy Programme, advice on the value of using IT in study and how to use IT facilities well, an overview for beginners of hardware and software, and details of IT facilities available in the university, including what is offered by the University Library and the Computing Service. About 14,000 copies are distributed each year. (Specimen copies of this booklet are available on request from the IT Education Unit – the address is at the end of this report).

The value of a threshold which can be shared with other institutions is recognised. Both Strathclyde and Glasgow Caledonian Universities examined the Glasgow model carefully before developing their own versions of it, and both also readily agreed to a shared IT Baseline. The Baseline has been shared since 1999-2000, and is adjusted each year at a meeting attended by all three institutions. This agreement means that students who move between the three Glasgow Universities will find that the IT certificate from their first institution has equal currency in the two others.

3.2. A Certification Scheme

Achievement of the IT Baseline requirements is marked by the award of a Certificate of Basic IT Competence by the University of Glasgow. Before the establishment of the compulsory IT Literacy requirement, certificates were printed by the IT Education Unit and issued individually to students. However, the resource outlay connected with preparing and printing the certificates grew alarmingly with numbers achieving it, and therefore since the compulsory era began, the certificate is recorded as an achievement on the individual's degree transcript, and not issued separately.

The question of whether to tie in the IT Literacy Programme with an externally validated certification scheme such as the ECDL, the Cambridge IT Certificate, the RSA CLAIT scheme, or the GNVQ/SVQ structure, was considered. Whilst external schemes would have provided students with an externally recognised certificate, it was felt that the internally based scheme offered more direct benefits. These were that the programme could be focused on what students need in order to be effective as students, rather than on generic IT requirements for the man/woman in the street, and the threshold could be adjusted as expectations for student capability changed; and that it could be delivered very cost-effectively, being funded by top-sliced central resources (always hard-pressed) and offered free of charge to students. The adoption of any external certification would have necessitated either unacceptable costs to the centre or to departments, or direct changing of students for assessment and for the award of a qualification. We have mapped the IT Baseline onto the syllabus of the European Computer Driving Licence, which is being canvassed in some quarters as a suitable certification scheme for students (and staff) in higher education, and if demand were to be evident, a top-up course plus assessment could be offered to students at an appropriate cost. There is no evidence that this demand currently exists amongst Glasgow students. An alternative strategy is that of gaining mutual recognition between university certificates based on a similar threshold, and Glasgow has already achieved such agreement with three other HEIs using a structure based on the Glasgow model.

Achievement of the IT Certificate does not carry any accreditation. The programme as developed carried no accreditation, but requests for accreditation were made from some quarters, and in one department the programme was effectively accredited, success in the assessments for the courses being converted to a mark which carried a very small amount of weight in a particular level one module. However, a situation where the programme was accredited in one department but not in others was seen as anomalous, and when the programme was made compulsory, it was decided that it should carry no credit in any faculty. Anomalies were thus removed, however a more major cause of concern was that the programme was intended from its commencement as an empowerment facility and not as an academic module with intellectual content appropriate to undergraduate level study. Were the programme to carry accreditation, its content and assessment would have to be viewed from a different perspective, and this might lead to the inclusion of elements which, whilst no doubt of value to students, would have made the IT programme a burden on their time sufficient enough to reduce their willingness to take it. The IT Education Unit approach is that if the programme is to be taken by every student, it must be perceived by students as useful and not particularly burdensome. A further consideration was that the programme offered different courses, and, with the compulsory requirement, an exemption scheme, which could have led to a situation where some students received the IT

Certificate with accreditation and others without (e.g. those who were exempted from taking a course or who passed the IT Test, as described below). The decision not to accredit the programme also avoided the question of how many credit points should be allocated to it.

3.3. A Variety of Routes to the IT Certificate

IT competence amongst students on entry to the University is highly differentiated, ranging from those who are completely unfamiliar with computers (a dwindling number) to those who are certainly in no need of any tuition at the basic level. Since the aim of the programme is to see that all have attained a minimum threshold, it is essential to have both a differentiated programme, to ensure that a variety of routes to the Certificate is available covering all levels of competence, and a needs analysis process which allocates each student to the route appropriate to them.

The programme offers four routes to the IT Certificate in 2002-2003:

a. **Exemption**: it is clear that there is a growing minority of student who already possess all or the great majority of the IT Baseline requirements; such students are exempted from a course requirement and awarded the certificate on the basis of proof that the Baseline has been attained. The proof can be documentation showing that an IT course covering the Baseline has been taken at another university (such as the ILIAD programme at the University of York); or at some other institution (e.g. school, FE college); the documentation could be a certificate showing what has been studied. Students can also be exempted from the course requirement if the Baseline is being covered within another course they are studying at the University; thus BEd students are exempted because the Baseline is covered and indeed considerably exceeded by a first year IT course - on successful completion of the IT module, the IT Certificate is awarded. A third cause for exemption is that a department will assert that students will only be recruited for particular courses if they already fulfil the Baseline requirements; this is the case with first year Computing Science students, and with a number of postgraduate courses in several faculties. The key point here is that no-one be burdened with an IT course who does not need it.

b. The **IT Test**: there are large numbers of students however who feel that through personal activity they have surpassed the Baseline but have no "official" proof of it. These students are given the opportunity to demonstrate their competence by taking an IT Test. The test lasts up to one and a half hours (most finish in less that this) and covers most of the Baseline requirements. Those who pass are awarded the IT Certificate; those who fail are directed to an appropriate course. The IT Test is taken in person under invigilated examination conditions. Proof of identity in the form of a valid matriculation card (which includes a sealed-in photograph of the legitimate bearer) is required for entry to the Test.

c. The **Standard Course** is designed for those who already have some IT experience but who wish to revise the basics or address some gaps in the Baseline competences. The course lasts 8 hours and is normally delivered in four 2-hour sessions. In 2001-2002 an on-line version of the Standard Course was piloted, and this is now offered as an alternative to the taught version of the course.

d. The **Beginners Course** is designed for those with little or no previous IT experience. The course lasts 12 hours, usually taught as six 2-hour sessions, and is delivered by

experienced tutors who are sympathetic to the needs of first-time computer users. It is anticipated that demand for this course will shrink steadily. However, enrolments for this course have not in recent years fallen as rapidly as was hoped, possibly due to students being over-cautious in their choice of course.

3.4. A Needs Analysis Procedure

For the system to work effectively, it is necessary to have an effective means by which students can take the route to IT certification which is appropriate to them. A range of needs analysis measures was developed on a rule of thumb basis. The most successful has been a simple flowchart which individual students can use to get a rough idea of the course which is most suitable for them. The flowchart was included in the *IT for Effective Study* booklet. Students also have, in the *IT for Effective Study* booklet, details of the content of each course, and can also use this information in choosing a route to the Certificate. A questionnaire prepared by the IT Education Unit containing specific questions which could be marked has also been used by some departments who preferred to allocate students to courses rather than allow them to choose themselves; it is available either as a web-based form or on paper. In some cases however departments prefer to allocate students *en bloc* to particular courses.

This year these measures have been superseded by a web-based on-line system. On the basis of a small number of questions, students are advised on the route which they should take, and are presented with an on-line registration form to complete. It is hoped that this system will reduce the number of students choosing to take courses which are below their capabilities. This would enable, for instance, tutors of the Beginners Course to focus on the needs of genuine beginners rather than those who feel that they may as well revise everything.

3.5. Integration with Subject Teaching

With the provision of a standard set of IT courses across the university, there is always that danger that the programme functions as a bolt-on extra with little connection to what students are studying, particularly where standardised courses have been developed. Where students' courses are organised through their departments, they are wherever possible delivered in their own departmental clusters. Thus students take the course in the cluster where they would usually expect to find IT facilities, they can be familiarised with any peculiarities of the login system, hardware/software provision and peripherals, and they take the course with others studying the same subject. ITEU supplies the tutor and the materials. Wherever possible, the tutor will be a research student in the students' own subject area, or a cognate one; this enables the generic activities in the course to be skewed towards appropriate subject matter, and for the tutor to be able to discuss in an informed manner the sort of tasks students in that subject area are likely to want to carry out. Tutors are also trained to gain a sense of the general capacity of their class, and to vary the pace accordingly; if there are particular difficulties, then an extra session may be provided to enable the course to be run more slowly, or a demonstrator may be provided to support the tutor.

The course material is designed to allow flexibility. It is generic, but encourages students to draw from their own experience and subjects of study for the practice activities. ITEU

does not have the resources to customise courses for individual departments, but extra items can be added if students are taking the courses in subject groups. Thus, for first year medical students, two additional sessions have been inserted into the Beginners and Standard Courses, one on searching medical bibliographic databases and one on CAL material for Medicine. The first of these sessions was prepared with input from the University Library's medical subject specialists, who trained the ITEU tutors to deliver it. The second is delivered by Medical Faculty personnel. To enable such activity, course materials are produced as a two-tier set:

a. every student on every course is provided with a set of **Applications Documentation**; this is a "what to press to do it" manual covering at a basic level all the applications covered in the course, which can be consulted by the student during the course and retained after it as a reference source. Because the Applications Documentation is printed in large quantities, the cost per unit is low.

b. for each course there is a set of **Course Notes** which takes the student through the course session by session, task by task, and includes the assessment requirements. References are made from the Course Notes to the Applications Documentation whenever appropriate. This enables the Course Notes to focus on movement through the course rather than becoming bogged down in detailed descriptions of which button to press next. It also enables departments who wish to add additional elements. If this is preferred, the department is supplied with the electronic file for the "generic" Course Notes; it can then add extra elements and print the Course Notes for its own students itself. Such modification can range from the two extra sessions inserted by the Medical Faculty for first year medical students to a single task inserted by the Biology Department requiring students to access the first year Biology course website.

3.6. A Delivery Agency

The IT Literacy Programme is run by the IT Education Unit (ITEU), which is part of the Information Services area. The Programme is centrally funded and is provided free of change to all students. ITEU is neither part of the Library nor the Computing Service, although it works very closely with both, and this independence was probably helpful in getting the programme off the ground, since students could not associate it with any historical baggage. It has also been valuable in enabling ITEU to focus on the programme as an educational exercise from the beginning. The director of ITEU, who developed the programme, came to it from an academic background in education; as well as maintaining the focus of the programme as educational, this was also significant in gaining credibility with other academics and made liaising with the subject departments easier than it might have been (had he been for instance primarily an administrator or technical expert).

Since its formation ITEU has, by making judicious use of the expertise gained through the IT Literacy Programme, diversified into income-generating areas, such as the delivery of in-service courses in IT to GPs, teachers and librarians, and into research and development activity funded at the moment by the EC and JISC. This has resulted in an increase in the number of staff in the Unit and the sharing of time over several activities. Thus when the programme began it was staffed by one full-time lecturer/administrator and a part-time secretary, along with 8-10 tutors paid by the hour for delivering the courses. There are now eleven staff in the ITEU; of these, two, and administrator and a secretary, work full-time on the IT Literacy Programme, liaising with departments, setting up courses, allocating students to courses, printing materials, setting up materials and other

documentation for tutors, administering the tutors, dealing with on-the-ground problems as they emerge (e.g. tutor is absent, network is down, student wants to change course, etc.), collating results and communicating them to the Registry, and assembling evaluation data. Other ITEU staff are drawn upon on an as-needed basis: a materials developer, a programmer and a network expert who is now developing IT courses for teachers and librarians. The director of ITEU monitors and shapes the overall strategic direction of the programme and liaison with upper levels of the University. And there are now around 40 post-graduate students working on a casual basis (paid by the hour) as tutors.

3.7. Alternative Provision of IT Skills Courses

Although the IT Education Unit is the major provider of IT skills courses for students at Glasgow University, other sources of provision exist. The University Computing Service runs a large programme of courses, mainly focused on specific software applications, for staff; postgraduate students are however also permitted to enrol for these courses. Some departments prefer to deliver generic IT skills to their own students themselves. In the teacher education area, government requirements for IT skills in newly qualified teachers mean that BEd and PGCE courses contain IT modules which take students well beyond the IT Baseline. The Computing Science department requires students to have attained IT Baseline competences before they enter the University. Various courses providing students with specialist skills beyond the IT Baseline are offered in faculty or departmental clusters by cluster staff. And most degree courses now include reference to the specific IT familiarities and the specialist software used in the subject area.

4. Strategy and Policy

The 1992 IT Strategy was just that: a vision of the not-too-distant future, and a set of complementary policy routes to enable the vision to be realised. The measures envisioned represented achievable policy goals, including login IDs for all students, large numbers of PCs available in the University library building, fast networking available to all, the "Common Student Computing Environment" (a set of generic applications available across the whole university network, and the "University-wide Introductory Course in IT". However, we are now beyond the period imagined by the 1992 Strategy, and most of its objectives have been realised, including all those listed above. The University is now in the process of reformulating its strategy in a number of areas, and part of that effort will be an Information Strategy. Yet the Information Strategy is only being formulated with difficulty, and the vision which should lie at its core has not been clearly articulated. There are certainly many developments now being pursued which will become part of that Strategy. For instance, consideration is now being given to the adoption and support of a Virtual Learning Environment (VLE) or Managed Learning Environment (MLE) across the whole university. Steps are also being taken to provide a common digital basis for document formulation across the university. Major digital collections are being built up, and being made available to researchers and students. Distance learning has been identified as an important area of activity. As yet no common strategy ties these developments, although this process is now under way.

The IT Literacy Programme has become an established part of the University's practice, and has continued to develop to meet the perceived needs of students. It is built into degree regulations, and flagged each year in the undergraduate prospectus. It is now in the process of being incorporated into the University's Information Strategy documentation.

The process of finding a vision to lie at the heart of Information Strategy has also become linked with the formulation of a Strategy for the Information Services Planning Unit. In this respect, the approach to convergence within the Planning Unit has become more cautious over time. Under Peter Kemp a confidence in a fully converged service, with each of the departments far more integrated with each other than at present, characterised the leadership of the planning unit. Under his successor Arthur Allison the approach was more muted, with an emphasis on co-operation and administrative cohesion rather than fully integrated operation. Under Chris Rusbridge, the present Director of Information Services, while the notion of co-operation is taken as read, there is a concern to explore the options for the way forward very carefully. What is clear is that a greater level of integrated operation is necessary, if for no other reason than to achieve most effective use of resources; but the preferred solution has yet to be identified.

One contextual factor is certainly different, the University's financial prospects. In 1992 it was possible to make medium-term planning decisions with some confidence that resources would be available to be able to bring the planned measures to reality. The situation is now more precarious, with many financial decisions only possible on a year-to-year basis, and more of them depending upon unpredictable factors such as the raising of income through delivery of postgraduate and CPD courses, wage settlements, results of RAE assessments, and sudden funding council changes to apportionment or procedures.

5. Emerging Directions

For the future, a number of developments are planned for the IT Literacy Programme. These are discussed below.

5.1. On-line Provision

After two years of development work, this year the IT Education Unit launched the on-line element of the student IT Literacy Programme. This involves a series of integrated on-line applications: a needs analysis, a linked course registration, an on-line materials delivery system, and a three-stage system of on-line feedback questionnaires. The needs analysis system replaces a printed flowchart which enabled students to see which course was most suitable to them, but left the final choice of course to them. It was felt however that this resulted in students too often choosing courses below their required level, either from over-caution or the feeling that "if it's there I may as well do the whole course"; one result of this however was to put too many people who did not really need it into the Basic (now renamed Beginners) course, who then put pressure on the tutor to move quickly, and left the students for whom the course was designed (i.e. beginners) feeling even more under pressure. It is also felt that more fairly IT literate students should be moving onto an on-line course, and should be steered away from the easy choice of a taught option. The new on-line needs analysis procedure offers students a small number of questions and, on the basis of their responses, advises them of the most appropriate route for them through the programme, them offers them a button to press for immediate registration. Students can opt for a different route, but it is more difficult to do, and may involve coming in person to the ITEU Offices.

The on-line course delivery system has been developed over a two-year period. It was first developed by a group of five third-year Computing Science students as a major project, then continued by one of them on a paid part-time basis, and is now being taken forward by the same individual as a full-time programmer within the ITEU. The system enables materials to be mounted in the form of short modules, each with a short quiz at the end as a self-test of progress. The system can be accessed in three ways, by students, by tutors, and by administrators, each being given appropriate accesses. A particularly valuable facility available to administrators is the production of statistics regarding individual students or the whole body of registered students. Tutors are able to see the progress of individual students, and can send messages to them through the system, the message being displayed the next time the student logs in. So far two courses have been mounted on the system, an on-line version of the Standard Course, and a set of "top-up" or revision modules for those taking the IT Test. The system was piloted in the Spring of 2002 with 65 students; thanks to the long development period, the system proved to be robust at its launch, and there have been no major crashes. The system will be available to all students in 2002-2003 in a "supported" mode, with a demonstrator in specified computer clusters at particular times to offer support.

It has been, from the inception of the IT skills course, an intention to gather and to study quantitative feedback. Information methods of feedback have been very effectively used to keep the programme developing in line with needs of users, but it was felt the quantitative data would be a valuable source of further insights. Indeed, large amounts of data have been collected using written questionnaires since the first year of the course, however, the

resource has simply not existed either to enter this data into an electronic data management system (such as SPSS) or to analyse it. A on-line system offers an opportunity to cut this Gordian Knot, since the data can be collected and organised at a simple level without the need for intermediate intervention. A postgraduate student built such a system, to ITEU requirements, as an MSc project in the summer of 2000, and, now that ITEU has a full-time programmer, the system is being comprehensively rebuilt, but following the same structure. This involves the administration of three on-line questionnaires:

a. **Questionnaire 1** is administered during the first session of any taught course, or at the beginning of an on-line course, and is also administered to test candidates and as many exemptees as possible. The aim of this questionnaire is gain a picture of students' IT capabilities and experience at the beginning of their degree course. Some of the information from this survey is of use to the university for planning purposes (e.g. information on students' existing access to computers). The prime value of this feedback is in gauging the changing readiness of students' for IT usage and thus the requirements which will need to be addressed by the programme.

b. **Questionnaire 2** is administered at the end of taught courses, and a version of it is being developed for on-line courses. It is concerned with students' experience of the course itself, such as the quality of materials, pacing, characteristics of the tutor or the facilities, and the content of the course. This information is mainly of value in planning the structure and content of the courses and considering matters of effective delivery.

c. **Questionnaire 3** is administered some months after the student has passed through the programme. Students are notified by email of the web address which will give access to the questionnaire; a sample are also sent a letter informing them of this. The intention is to capture the students' actual usage of IT after they have been through the programme. This will enable questions to be addressed about the utility of what is offered through the programme, and to identify elements which might be dropped from current courses because they are not being used, or which need to be added to the course provision. It will also identify IT facilities which students should be using but are not, and will point directions for further investigation.

Experience so far already shows that questionnaires 1 and 2 are effective in delivering feedback. 2001-2002 is the first year in which all three questionnaires are being used, and at the time of writing (September 2002) the data for that year is being collated and analysed.

5.2. Information Literacy

The IT Baseline will continue to evolve to respond to needs of student entering higher education. In session 2001-2002 it was adjusted to include the evaluation of on-line sources, and this trend towards the inclusion of information literacy elements will continue. There is at the moment a convergence taking place of these two major movements: that of IT literacy, largely pursued so far by IT service or educational personnel, and information literacy, developed and pursued by library and information science personnel. Each has a long history and its own approaches, and the merger of these two strands will take some time to happen. The ongoing convergence of Library and Computing Service provision in universities helps to push this forward, although it is already clear that the integration of these services presents major cultural and organisational challenges.

5.3. Provision Beyond the Baseline

Now that the Literacy programme is running at its target level (all students in their first year of study – about 5,200 per annum), further attention is now being focused on course provision beyond the IT Baseline. Whilst the Baseline programme is intended to prepare student to use IT effectively as students, consideration also needs to be given to preparing students for more advanced academic work, and for the passage into employment. This may involve the development of further baselines or benchmarks, in which there will be more of a subject focus than with the IT Baseline programme. This work is being carried out during the present academic session.

5.4. Integration into a University-wide VLE

The University is currently moving toward the adoption of a particular Virtual Learning Environment (VLE), to be made available to all students and staff, and to be fully supported with technical provision, help service and a training programme for staff. When this decision is made (possibly summer 2002) and the system installed (2002-2003), there will be two major implications for the IT Literacy Programme. First, ITEU has committed the IT Literacy Programme to being one of the first to move its on-line provision off its in-house-developed delivery system and onto the University's chosen VLE. This will involve considerable work, but will also enable the capabilities of the chosen system to be fully exploited. The on-line Literacy Courses may also serve as a model for staff wishing to use the system, and thereby act as a form of dissemination. Second, when the choice has been made, IT Literacy provision will have to evolve to ensure that students are effectively prepared for confident VLE-usage. This will undoubtedly involve adjustments to the course provision so that appropriate skills are offered to students to enable them to use the full capabilities of the system. A small example of this type of adjustment has been the incorporation into IT courses of student usage of SURF, a web-based system allowing students access to some elements of their own records.

5.5. Key Skills Issues

A less urgent, but nevertheless developing issue is that of the provision of "key skills" to students. Although definitions of key skills vary, almost every one includes generic IT skills of the type delivered through the IT Literacy Programme. A working party on key skills has recommended in spring 2001 that progress be made on developing a structure in which key skills can be acquired and effective recording of key skills acquisition can be made, and a new working party is now taking this forward. This will have significant implications for the IT Literacy Programme, since it will have to adjust to meet whatever system is developed (which could take some time). However, the lessons learned in developing and delivering the programme will be fed into the debate, and may enable forward movement in some areas.

5.5. Cross-Sector Collaboration

Finally, the question of developing an IT Literacy Structure for the Scottish Higher Education sector is one which the IT Education Unit has been concerned with. The agreements with Strathclyde and Glasgow Caledonian Universities form a good beginning for moves in this direction, and efforts continue to see whether others can be persuaded to

join in a collaborative effort. Use of our materials has also been licensed to Warwick University and Queen Margaret University College, Edinburgh, and translations have been made into German and Czech for use at the Johannes-Gutenberg-Universität, Mainz and at the Czech Technical University, Prague, respectively. As higher education becomes a highly competitive global market, and as governments increasingly free this market from national protection and subsidy, high levels of co-operation between Scottish higher education institutions may be required to secure the continuing high reputation of Scottish Higher Education.

5.6. Conclusion

The IT Literacy Programme is well-established at Glasgow University. It has developed over a period of years, largely by consensus, rather than being imposed, and the compulsification of the programme only came at a point when the utility of the programme was well recognised by both departments and students. It should also be clear however that the programme is far from static, that restructurings and modifications have occurred every year from its inception on, and will continue to do so. It will also continue to play an important part in the preparation of students for effectiveness in an IT-rich study environment and an IT-rich world.

Bibliography

ITSC (1992) *The Future of Information Technology at the University of Glasgow* University of Glasgow Report prepared by a working group of the Information Technology Strategy Committee. 17 December 1992

Trainor, R. (1986) "Introducing Microcomputers into History Teaching and Research: The DISH Project" *CTISS File* **2**: 14-17

Trainor, R. (1988) "Implementing Computer-Based Teaching and Research: the Need for a Collaborative Approach" *Computers & Education* **12**: 37-41

Details of the current IT Literacy Programme at the University of Glasgow can be found on the web at: http://www.iteu.gla.ac.uk/students/

To obtain a copy of *IT for Effective Study*, write to: ITEU, Round Reading Room, University of Glasgow, Glasgow G12 8QQ, Scotland, or email: iteu@gla.ac.uk

Appendix: Statistical Overview of IT Literacy Programme Development

1. Registrations

Year	Target	Registrations	Completions
1994-95	700	702	-
1995-96	2000	2857	-
1996-97	4000	4002	-
1997-98	-	4245	-
1998-99	-	4997	3815
1999-2000	-	5226	4683
2000-2001	-	5657	5254
2001-2002	-	5451	-

2. Completions & Rollovers

Year	New Entrants Requiring Certificate	Previous year Rollover	Total number requiring certification	Completions by students requiring the Certificate	Outstanding from this year	Outstanding from last year	End of year Rollover
1998-1999[a]	3582	-	3582	3139	443	-	443
1999-2000[b]	4805	443	5248	4646	504	98	602
2000-2001	4833	602	5435	5254	181	0	181
2001-2002	5139	181	5320	4768[c]	552[c]	0	-

Notes
a. First year of compulsory requirement: applied to undergraduates only.
b. Requirement applied to both undergraduate and postgraduate students
c. As at 5 August 2002; completions continue until end of September.

3. Routes

All figures below are for completions by students required to obtain the IT Certificate.

Year	Exemptions		IT Test		Orientation Course		Basic Course		Total
	No.	%	No.	%	No.	%	No.	%	No.
1998-99	-[a]	-	700	22.3	1291	41.1	1148	36.6	3139
1999-2000	1287	27.7	724	15.6	1387	29.9	1248	26.9	4646
2000-2001	1397	26.6	889[b]	16.9	1649[c]	31.4	1319	25.1	5254
2001-2002[d]	1657	34.8	1242[e]	26.0	1319[f]	27.7	550[g]	11.5	4768

Notes
a. Exemption route not available.
b. Includes Test-only (877) and Fast-track Course (1 session plus test)(12).
c. Includes Orientation Course (1570), Standard Course (69), and Refresher Course (10).
d. Figures at 5 August 2002; completions continue until end of September.
e. Includes Test-only (884) and Fast-track Course (358)
f. Renamed as Standard Course; includes Standard Course (1278), Online Standard Course (31) and Orientation Course (10).
g. Renamed as Beginners Course.