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Global Campus: Learning to walk with Webbed Feet

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Abstract

Universities that wish to expand their provision beyond their local catchment areas need to consider whether to bring the students to the tuition or take the tuition to the students. Current-day educational and information technologies make the latter option a much more achievable prospect than it has been in the past. Nevertheless, careful consideration needs to be given to the nature of the distance-learning students' learning experiences and the extent to which these may be comparable with those of the local students.

These matters are considered in this paper against the background of the Global Campus project whereby Middlesex University's School of Computing Science sought to take its initial steps in distance-learning provision.

1. The Proposition

By British standards Middlesex University is a large university with 22500 students [1]. Approximately one student in 7 is enrolled on a course in the School of Computing Science. Middlesex maintains a number of campuses spread across North London and this is the community which it principally serves. In order to prosper Middlesex aims to maintain and enhance its provision and, since it became a university in 1992, this endeavour has been conducted against an increasingly difficult national funding climate, where the 'unit of resource' has fallen year on year.

Middlesex's strategy has been to expand its client base and in particular to seek clients who draw on alternative sources of funding. As a result, some 13%

of Middlesex's students are now overseas students [1], most of whom come from countries with strong historical ties with the United Kingdom or where an English-language education is sufficiently highly valued to justify the fees which overseas students are charged. The result of this strategy is that the demand for a Middlesex education is increasing, but potential overseas students are beginning to find it difficult to realise their aspirations as they (or their countries' economies) encounter funding difficulties themselves.

Against this background Middlesex began to consider how it could take its provision to potential overseas candidates who were not able to attend courses in London. A variety of (largely paper-based) distance-learning packages were developed by various Schools (*faculties*). For its part, the School of Computing Science wanted to exploit electronic media in making its contribution to the distance-learning effort – and that is how the Global Campus project came to be conceived.

In this paper we describe how we planned the project and developed and delivered the curriculum. Some of our original goals have been achieved; others require more effort or more time; and some have been re-cast in the light of our experiences.

Section 2 describes the criteria we originally sought to satisfy together with the initial planning that launched the project. Sections 3 and 4 cover various aspects of the infrastructure that were necessary to construct to support the project and ensure its delivery. In section 5 we consider the outcomes which the project has so far produced for our students, our partners and ourselves.

2. The Plan

In embarking on its distance-learning programme the School was mindful that its planning and procedures must demonstrably ensure no reduction in the quality of provision. In this we were greatly aided by the University's Centre for Learning Development (CLD) which produced a timely set of guidelines for us to work to [10]. Whilst recognising that the experiences of distance-learning students and their local counterparts would be different, the chief premise was that the content, structure or presentation of the distance-learning curriculum should be formulated in such a way that their respective experiences were *equivalent*. This precept makes the learning experiences of the local students a benchmark against which the distance-learning curriculum can be measured, and much ingenuity has been applied to devising appropriately 'equivalent' experiences.

The Same Curriculum. As a starting point, it was decided that, instead of designing a special curriculum for a new distance-learning award, the project would create a distance-learning mode of study from its existing provision. This meant selecting one of the courses offered in London which might appeal to students studying abroad. We chose the MSc in Business Information Technology, for the following reasons:

- (i) The field has been a growth area for employment so completing students should have good job prospects and a strong incentive to embark on the course.
- (ii) The course was a vocational, postgraduate programme. This meant that candidate students already have considerable experience of higher education and would be likely to possess, in advance, study skills which it would otherwise be difficult to develop at a distance.
- (iii) The course was (and still is) extremely popular in London.
- (iv) The course was already offered as a franchised course to the Regional Information Technology Institute in Cairo, so the course team had some experience of delivering it abroad.
- (v) The course consisted of eight taught modules and a project. This represents considerably less development work (although in a shorter time-scale) than would attempting a full three-year undergraduate programme.

(vi) The course was offered as a two-year part-time course and this format was expected to appeal to the type of student who would find distance-learning amenable – postgraduate students in full-time employment. The students study two modules each semester for four semesters and spend two semesters on their projects. This had a beneficial impact on the development plans, since it would only be necessary to develop two new modules each semester to keep up with the first cohort of students.

The Same Assessment. It was also determined that the distance-learning students should undergo assessment in the same format as the local students. Where local and remote students were studying a module simultaneously, the assessments would be identical. This implied that unseen examinations would have to be sat simultaneously (to ensure that they would indeed be *unseen* by all candidates). In turn this implied some sort of institutional context in place, wherever the students were studying, in order to administer and invigilate the examinations. As the plans developed, a key element of our particular format of distance-learning delivery thus emerged – the requirement to form local partnerships with institutions capable of acting on Middlesex's behalf. Students enrolling on our course would not be isolated individuals, studying entirely at home – they would be part of a cohort associated with (maybe enrolled at) a local *Learning Support Centre* (LSC).

The Same Lecturer. The School was aware that a considerable investment would need to be made in the development of learning materials. Faced with the options of attempting to buy these 'off-the-shelf', or of commissioning them from third parties, or of developing them 'in-house', the *equivalence* principle dictated that it had to be the last of these. Middlesex lecturers, designated as *module-leaders*, are responsible for defining the syllabus and delivering the curriculum for any given module. Any in-house development therefore had to be done under the academic control of the relevant module-leaders. The project team was aware that different lecturers approach their teaching in different ways and, where change is indicated, may experiment in different directions. In most institutions (including Middlesex) web-based and other electronic teaching technologies are made available to staff generally to experiment with and to improve their teaching as they see fit. However, the team did not feel that the project could afford to take this route, since:

(i) It was on a tight schedule to produce two modules per semester so there was little room for experimentation.

(ii) It was unlikely that a single lecturer could author all the materials in time so it would be necessary to share out the work amongst several authors.

(iii) To ensure a consistency of approach therefore, authors would have to work to a fixed **pedagogy** – a standardised presentation format and learning style.

(iv) Although many of us have years of experience as ‘stand-up’ lecturers, fewer have anything like as much experience of other forms of tuition, so there would be a learning curve to climb, for the project as a whole, as well as for each author.

A number of further decisions arose from these considerations:

(i) The project would need to develop a training programme for potential authors, to ensure that the goals of the pedagogy could be swiftly and effectively met.

(ii) All materials should be reviewed by an independent reviewer.

(iii) Since the bulk of the School staff would be fully occupied with authoring tasks, resources would not be available for digitising the materials (so this work needed to be outsourced), nor for developing a proprietary virtual learning environment (but this **could** be bought off-the-shelf).

(iv) It would be valuable to *pilot* the course with a small group, whose feedback could help to keep us on track, before launching the course on the world.

(v) Because most modules have large class-sizes, the module-leaders seldom see all the local student seminar groups. Instead, these sessions are conducted by other staff or graduate students. In the case of distance-learning students, equivalent sessions could be provided at (and by) the Learning Support Centres.

The Same Support. For on-campus students, Middlesex maintains a substantial administrative support system via Student Offices located on campus. Students also have online access to the student record system. Whilst the latter facility was easily extended to distance-learning students, it would not be possible to provide the same face-to-face support service given by the Student Offices. It was decided that the project should provide its own administrative support to act as an interface (via email) between the distance-learning students and the London-based Student Offices.

3. The Platform

Virtual Learning Environments (VLEs) permit synchronous, collaborative interaction among instructors and students, while also providing asynchronous learning resources for individualised use by students at any time. They consist of:

- registration and authentication portals where a student’s identity is checked and entry permission is given
- virtual classrooms and labs
- synchronous and asynchronous meeting rooms (chatrooms and discussion forums)
- noticeboards, student management tools etc.

The main advantage of using a commercial VLE is that it can encourage standardisation and collaboration between learning communities.

WebCT [9] was used to implement the Global Campus pedagogical model. However, we also offer CD-ROMs containing all the course material except for the activities, to substitute for online access.

4. The Pedagogy

In earlier work [2, 3] we reported on the pedagogic model used and the learning environment that was constructed when the project was initiated. The *I CARE system* [4] pioneered at San Diego State University, was adapted to provide an infrastructure for the main body of web materials. It is a five-step instructional model, named to stand for *INTRODUCTION, CONNECT, APPLY, REFLECT* and *EXTEND*.

A departure from the original I CARE system was to re-interpret the *CONNECT* element of I CARE as *CONTENT*, as it was thought that *CONTENT* would have a more obvious meaning for students. This departure allowed lecturers to envisage how their ‘notes’ could be re-written and digitised as tailor-made learning resources within the required format for the new medium.

The *I CARE* materials are split into sections:

- The *INTRODUCTION* serves to place each unit in the context of the module as a whole, and includes clearly stated objectives.
- The *CONTENT* section is primarily for presenting new information. Typically it presents a fairly linear development of the material with short ‘in-line’ exercises to summarise or test understanding.
- The *APPLY* section is the practice section of each unit. Hyperlinks from the *CONTENT* section offer

the opportunity to move to activities with a wider, more exploratory scope. These may be computer-based, such as programming or design exercises; paper-based, such as examining case studies; or web-based, such as visiting relevant web-sites. Their purpose may be to embed newly-gained knowledge or to motivate the introduction of the next sub-topic.

- The *REFLECT* section gives students an opportunity to reflect on their newly acquired skills and knowledge. Hyperlinks from the *CONTENT* section lead to questions designed to reprise recently-learned material in a reflective or synoptic way. Many of these may look like the descriptive components of typical examination questions, so they can also be used as revision aids.
- The *EXTEND* section can provide closure, prompt further exploration and assess students' skills and knowledge via a short Review Quiz.

I CARE and linearity. Another transition from the original I CARE model was a transformation of the *CONTENT* section from a fairly linear presentation of material to a network of online or offline resources (textbooks, journals). Additionally a structured network of hyperlinks to and from *APPLY* activities and *REFLECT* questions was adopted giving students opportunities to move away from the narrative into collaborative activities, discussions, reflective exercises and online self assessment (see Figure 1).

These cross-references represent semantic networks of knowledge as well as intuitive navigational routes through the course rather than simply focussing on the surface features of the site [5].

Constructivist vs. instructionist. Current approaches to learning and teaching are characterised by:

- flexible delivery and a move towards resource-based learning [6].
- a change in the role of the tutor from "sage to facilitator" [7].
- a potential conflict in course design between instructionist (behaviourist) and constructivist practices.

Our course components attempt a transition from a behaviourist to a constructivist approach and from tutor-centred to student-centred learning. Online resources create opportunities for interaction with the course's online community. There is potential for the students to select from a variety of learning resources

and styles [8], engaging in collaborative activities, and participating in joint assignments.

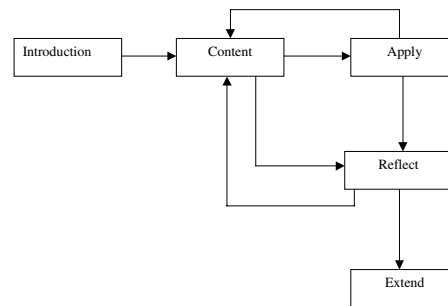


Figure 1: Pattern of study in ICARE model

Support for a more constructivist approach arises through:

(i) The I CARE WebCT material itself with its non-linear, interactive structure which encourages discovery by the learners either individually or collectively.

(ii) The WebCT interactive facilities (bulletin boards, virtual chat rooms and virtual whiteboards) which offer the potential for negotiated learning and the sense of belonging to a learning community.

Feedback comes in four formats: task oriented feedback from the facilitator; facilitator/peer feedback, either face to face or through bulletin board-based review activities; automated feedback in *APPLY* (suggestions for activities), *REFLECT* (suggested answers to review questions) and *EXTEND* (suggested topics and recommendations for online discussions) and automated self-evaluation via the online quizzes.

5. The Products

Use of Materials

We tried to determine the extent to which students made use of the web-based materials while following the course. WebCT keeps records of the number of times each student logs in to the site. However, since each student also has the option of accessing the materials on a CD-ROM or of printing out the supplied *pdf* files, different learning patterns are possible. As a crude discriminator, we took the view that any student who never logs on at all would be exclusively using the CD-ROM, whilst those who logged on only a few times probably depended on the printed notes. Accumulating the raw statistics over

five semesters yielded the following figures (Table 1.)

Table 1. Distribution of learning patterns

Module	%Web Users	%Paper Users	%CD Users
4120	25	40.79	34.21
4222	34.48	42.07	23.45
4127	35.07	42.54	22.39
4223	35.47	54.65	9.88
4111	45.12	35.35	19.53
4130	50.76	25.76	23.48
4225	55.69	24.71	19.61
4226	89.01	10.56	0.43

At first sight these figures seem to be fairly evenly spread. However, there is a certain amount of evidence that, from module to module, the students select the medium which most suits the module. For example, the learning materials for module 4223 most closely resemble a traditional textbook format, and, by a small margin, the bulk of the students seem to prefer the printed format. By contrast, module 4120 is a programming module where many of the tutorial examples are executable and this module shows the highest percentage of CD users. In module 4226 the coursework assignments call for groupwork on the bulletin board, so this module shows a much higher *hit* count.

The next investigation concerned the use of the quizzes. The project team took the view that regular progress through the course materials would be evidenced by regular attempts at the weekly quizzes. Since this activity was not a mandatory assessment element, positive correlations here would serve as a plausible validation of our pedagogy. In the event, very few students seem willing to put themselves through this test – the figures in Table 2 record the percentage of students who made any attempt at the quizzes.

Table 2. Web users and quiz takers

Module	%Quiz Takers	Mean Hits
4223	5.8	16
4127	5.8	17
4111	9.8	21
4130	9.9	29
4225	13.7	33
4120	14.0	18
4222	15.3	23
4226	18.2	85

At the very least we can conclude that the positive reinforcement provided by successfully completing a quiz does not of itself provide sufficient motivation to attempt the quiz (or conversely, that a fear of failure is a countervailing disincentive). To test the theory that the quizzes encourage better learning

through reinforcement it seems we will need to introduce some element of compulsion.

Those modules with the greater web usage showed broadly higher levels of quiz-taking since the quizzes are only accessible on the web. Nevertheless the correlation is not strong.

Student Attainment

Students studying at the different centres are drawn from different cultural and vocational contexts and it is not to be expected that their results would be directly comparable. However, if the distance-learning students did *significantly* worse than the local students, that would cast some doubts on the efficacy of our methods. If the distance-learning students, on the other hand, did significantly better, we might worry that we were recruiting the wrong students (holders of a cognate first degree are not eligible for enrolment), or that the students were getting more assistance than was legitimate!

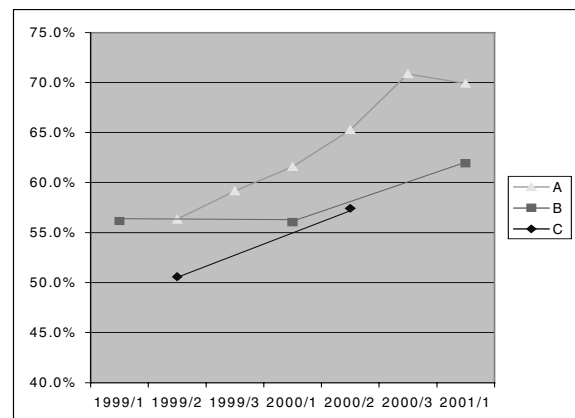


Figure 2: Mean pass marks for module 4120

In the event, no such dramatic figures have emerged. Figure 2 shows the mean pass mark for one module obtained by students at various centres since just before the inception of the distance-learning programme. Centres A and B are overseas LSCs whilst C is one of Middlesex's local campuses. Although students at the different centres have performed differently, the gap is not so dramatic as to give cause for concern. However, there are some features to observe:

- Students at centre A show a steady improvement from one semester to the next. It is unlikely that we are enrolling better students or setting progressively easier exam questions each semester. We believe the

most probable cause is the quality of the tutors at centre A. They have learned how to utilise our material and how to prepare students for Middlesex exams. Our learning materials were designed to be used in conjunction with face-to-face tutorials and these figures show us how important those they are.

- At centre B the course was initially taught as a franchise, but was this year changed to the distance-learning mode. The improvement in student attainment could be a sign that the course materials (for this module at least) are effective learning resources. However, it will take a few more semesters' worth of data to smooth out the effects of the other variables.
- For centre C the course was initially taught in 'traditional' mode, but was this year changed to the resource-based mode. Again, it looks like an improvement, but we need more data.

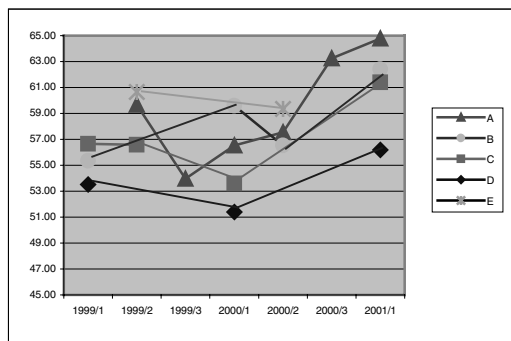


Figure 3: Mean pass marks for module 4226

Figure 3 shows the same statistics but for a different module. Centres A, B and C are the same, but the module is also offered at two other Middlesex campuses. The picture here is more confused. The most significant event was probably the change in module leader at the end of 2000. The new module leader uses the learning materials locally in resource-based mode. These modules were the first to be developed and so have the most data. However, the other modules show broadly similar patterns.

6. Conclusion

Although we feel that we have covered a lot of ground in a short time, the project team is aware that we are really only at the beginning. Our course materials are a substantial resource that must be maintained and improved. Our pedagogy is still unproven and we need to investigate its efficacy

more thoroughly. Finally, the technology exists to help us make our students' learning experiences more intense, more engaging and ultimately more productive and that is the next goal that we must pursue.

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