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Going Outside the Box: Skills Development, Cultural Change and the Use of On-line Resources

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Abstract

Using an academic library has always been a crucial part of studying in higher education, but this has presented problems for independent learners taking distance education courses. In the past, Open University (UKOU) students received almost everything needed to successfully complete any course. Nowadays, growth in Internet use enables learners to go 'outside the box' to locate resources that might be relevant for their studies. Although such resources are increasingly being included as components of UKOU courses, the extent to which students use them varies enormously between courses. Data from a large-scale survey is examined and a number of explanatory factors are considered in an attempt to account for this variability. It is argued that students' use of on-line 'external' resources is closely related to the pedagogic design of courses and to assessment requirements, not merely to the increased availability of information sources on the World Wide Web.

Keywords:

Distance education; lifelong learning; pedagogy; teaching/learning strategies; telelearning.

Introduction

The Dearing Committee (National Committee of Inquiry on Higher Education, 1997) expressed an expectation that students should become progressively more *self-directing* in their studies and it emphasised the enhancement of skills necessary for handling the abundance of information that is becoming accessible through information and communication technologies (ICT). Students will need to “develop advanced skills in searching for and selecting valid, relevant and up-to-date information from computer-based storage” (Para. 8.34).

Complex information handling requires both operational and cognitive skills: operational skills to effectively locate and retrieve information, and cognitive skills to evaluate and select what is relevant and useful from what they find. These cognitive skills cannot be wholly generic, because learners must already know enough of a particular subject in order to make judgments about what is relevant and appropriate (Candy, 1988). In higher education (HE), it is commonly assumed that learners will be in a better position to make such judgments at the higher levels of the undergraduate curriculum or in postgraduate study. As they progress through their studies students develop as learners and become less dependent upon their teachers (Perry, 1970; Belenky *et al.*, 1986) and the institutional system (Beaty and Morgan, 1992; Beaty *et al.*, 1997).

Growth in Access to Resources in Higher Education

Traditionally, the primary source of information and resources for teaching and learning in HE has been the academic library. The range of information resources available and the means by which they can be located and accessed are currently subject to dramatic changes that result, in part, from digitisation and the widespread adoption of ICT.

Recently, considerable funding has been provided for the development of accessible digital resources that can be shared within the HE community, particularly through the Joint Information Systems Committee of the United Kingdom HE Funding Councils. In addition to digital resources created *within* the HE community, there exist many types of *external* resources that are potentially of value in HE. These include on-line journals and e-books; digital collections in libraries, museums, galleries; archives and databases; information from governmental and non-governmental agencies; reports from news organisations; information and data from companies and special interest groups. These resources vary greatly in terms of both quality and quantity.

Despite advances made in terms of developing, acquiring, maintaining and delivering electronic resources to the HE community, the uptake of such resources in teaching and learning has yet to reach a significant level. Multi-institutional studies of HE students’ use of on-line resources (Armstrong *et al.*, 2001; Rowley *et al.*, 2002) have found that learners frequently search the Internet for information related to their studies, whereas dedicated electronic information systems for the HE community were little used.

Calverley and Shephard (2003) contend that the successful uptake of on-line resources requires collaboration between two professional groups with different perspectives: information specialists and academic teaching staff. The former group have tended to adopt ‘collection-focussed’ strategies, primarily concerned with

building resource collections and the associated retrieval and delivery systems. Calverley and Shephard argue that the effective use of on-line resources in teaching and learning requires more than just the *provision* of good learning resources: ‘user-focussed’ strategies are also necessary. Information specialists and teaching staff must work together to identify the needs and expectations of users and to match these to available resources.

Inside and Outside the Box

Distance education courses developed for adults studying independently have tried to provide almost all the learning resources required. For example, students of the UK Open University (UKOU) are sent one or more packages containing specially prepared texts, audio-visual materials, computer software, study guides and off-prints (journal articles, book chapters, etc.) as well as assessment materials. Students had no need to go ‘outside the box’ of comprehensive materials developed or specified by the course team.

While students were free to go ‘outside the box’ to consult relevant resources, there was, in the past, no requirement or incentive to do so. Courses that included a project or dissertation element were exceptions; they allowed students limited freedom to investigate to some depth a topic of their own choosing. In recent years, however, the ‘information explosion’ associated with Internet technologies has changed the situation for most independent learners: they are no longer disadvantaged to such an extent in terms of access to specialist library and information facilities.

Access to the Internet

Substantially increased access to the Internet is one of the main factors that enable independent learners to go ‘outside the box’. By 2001, half of UK households contained a computer and 40% had access to the Internet (Office for National Statistics, 2002). The annual survey undertaken for the Independent Television Commission (Towler, 2003) reported that almost half of all homes with children had an Internet connection in 2002 and that there had been a very rapid rise in home access (to 46%) among those aged 45-64 years. A more recent study reported that 62% of UK adults had accessed the Internet at some time (National Statistics, 2003). Table 1 presents data from that study, showing variations in terms of gender and age.

Table 1 About Here

A large proportion of those adults likely to enrol for distance education courses are in the age range 25-44 years: currently about two-thirds of UKOU students are within this age group. Use of the Internet is very high (i.e. over 80%) among this group, as seen in Table 1.

In recent years UKOU students’ reported access to a networked computer has increased considerably. Table 2 shows that by 2002 computer access (primarily at home) was in excess of 83% and Internet access was above 78% in all faculties¹.

Table 2 About Here

¹ Programme on Learner Use of Media (2003) ‘IET Courses Survey 2002’, Internal Reports to Academic Units. Milton Keynes: The Open University.

Some UKOU faculties offer more courses that *require* students to access and use ICT than others; surveys consistently find that a higher proportion of students in those faculties report having access to ICT and using it for their studies (Kirkwood & Price, in press). Students taking courses in management, technology and mathematics & computing have tended to have higher than average levels of access and use of ICT. In contrast, students taking courses in arts, health & social welfare, languages and social sciences have tended to have lower than average levels of ICT access and use.

On-line Resources via the Open University Library

Another main facilitating factor is the increased availability of digitised information. Anybody with an Internet connection can access many millions of web pages that are currently available from a wide and diverse range of providers. Survey data indicates that a high proportion of UKOU students are searching the Web for information that might be relevant in their studies, even if this is not expected on the courses they are studying.

In 1999 the UKOU Library started to provide many of its facilities and services on-line to students wherever they were resident (Ramsden, 2003). Dispersed learners could use the OpenLibr@ry to search on-line catalogues and databases and to access on-line journals and electronic texts. Course teams were encouraged to make use of the ROUTES facilities (Resources for Open University TEachers and Students), a customised database of links to quality assessed external websites relevant to a particular course.

Method

There were two research questions to be addressed. The first was: *'How much use are UKOU students making of on-line resources in their studies?'* The subsequent research question was: *'What course characteristics account for any important variability in students' use of on-line resources found between courses?'*

In order to examine the extent to which UKOU students have used on-line resources in connection with their studies, information has been extracted from the dataset of the Courses Survey conducted in 2002². This section provides details of the courses and the students in the survey sample, the relevant survey questions and the data analysis procedure.

The courses and students in the survey

The annual Courses Survey is a large-scale postal survey of students, one of the major instruments for monitoring and evaluating the courses and services offered by the UKOU. Each year's survey covers a sub-set (typically about one third) of the total award-bearing courses available for study in that year. All courses being presented for the first time are included, as are a large selection of courses in their second or subsequent year of presentation. Students who complete a course provide feedback about their use of, and their level of satisfaction with course components and services associated with their studies in the current year.

² IET Student Statistics Team (2003) Open University Courses Survey, November 2004, dataset and internal papers/analyses.

Very large numbers of students receive the Courses Survey questionnaire. Students are sampled on the following basis: If the course population is 399 or less, all students are surveyed; if it is greater than 400, a random sample of 400 is selected. In 2002 a total of 122 courses were included in the survey and there were 16,389 respondents - a response rate of 63%.

In the modular award structure of the UKOU, the courses surveyed are usually equivalent to 30 or 60 CAT points (i.e. equivalent to 25% or 50% of full-time study). While the data collected for most individual courses is quite robust, the aggregated data for academic units and for the university as a whole can be only an approximation based upon the particular sample of courses chosen in any year.

The survey questionnaire

The instrument includes a wide range of questions, only a small number of which are about students' access to and use of ICT in connection with their studies. The survey questionnaire was mailed to students in October, shortly after examinations had been taken. A reminder card was sent after two weeks to prompt students to return their completed forms. The number of respondents for each course varied, reflecting differences in course populations.

The question pertinent to this research asked students "How often did you access ..." and listed 3 UKOU on-line facilities (i.e. OpenLibr@ry, ROUTES and their course website). Five response options were available: 'More than once a week', 'Weekly', 'Monthly', 'Once or twice' and 'Did not access'.

Initial data processing

For the particular question about students' use of on-line resources, the frequencies for each positive response option were combined to determine the proportion of respondents for each course that had made *any use* of the on-line facilities, i.e. students indicated that they had accessed the facility at least once during the study year. By combining responses to the first three response options it was possible to determine what proportion of respondents had made more than minimal use of the facilities, i.e. *monthly or more*.

Results

Research question 1

'How much use are UKOU students making of on-line resources in their studies?'

The initial data analysis enabled research question 1 to be answered in respect of both OpenLibr@ry and ROUTES facilities. A total of 4,312 respondents (26.3%) had made *some use* of OpenLibr@ry services, while 3,434 respondents (21.3%) had made *some use* of ROUTES facilities.

In principle, all registered students with access to the Internet can use the OpenLibr@ry facilities. However, in respect of individual courses, the proportion of respondents who had actually accessed the on-line library facilities at least once during the study year varied considerably. It ranged from 6.3% to 94.8% across 122 courses – see Figure 1, which shows the uptake frequency by course from the lowest (left) to the highest (right). The proportion that had made *any use* of the OpenLibr@ry facilities exceeded 80% on 8 courses; while on 9 courses fewer than 10% of respondents had done so.

Figure 1 About Here

ROUTES pages provide a customised database of links to quality assessed external websites relevant to a particular course. Course teams choose whether or not to include these as a course component and only half of the courses surveyed in 2002 (61) included ROUTES facilities. At the course level, the proportion of students who had accessed the on-line ROUTES facilities at least once during the study year varied considerably, ranging from 0 to 76.4% across the 61 courses – see the upper line in Figure 2, which shows the uptake frequency from lowest course (left) to highest (right). For only 11 of the 61 courses had 50% or more of respondents indicated that they had made *any use* of the ROUTES facilities. For 7 courses, there were fewer than 10% of respondents who had used the on-line ROUTES facilities.

Figure 2 About Here

Intensive use of on-line resources

While some students might have accessed the facilities ‘once or twice’ for curiosity or to explore what was available, intensive use of the resources probably requires more frequent access to be made. The lower line in Figure 1 shows the proportion of respondents that had used the OpenLibr@ry facilities more frequently than just ‘once or twice’ (i.e. they had selected one of the first three response options). For 80 of the 122 surveyed courses, fewer than 10% of respondents indicated that they had used the OpenLibr@ry facilities to this extent. On only 11 courses were there more than 30% of respondents who had used the facilities ‘monthly’ or more frequently.

Frequent use of the ROUTES facilities was uncommon – see the lower line in Figure 2. For 37 of the 61 surveyed courses, fewer than 10% of respondents had used the ROUTES facilities ‘monthly’ or more often. On only 7 courses were there more than 30% of respondents who made more than minimal use of the facilities.

Research question 2

Further analysis of the data was necessary to address the second research question: *‘What course characteristics account for any important variability in students’ use of on-line resources found between courses?’*

Due to the large number of courses included in the survey and the considerable variability in students’ use of both the OpenLibr@ry and the ROUTES facilities, examination of the data for extreme cases was considered appropriate. On the basis of the frequency responses, courses were allocated to ‘High uptake’ and ‘Low uptake’ categories. There was a high degree of overlap among courses in the ‘High uptake’ categories for the two types of on-line resources: Only one courses with ‘high uptake’ of ROUTES facilities was *not* also in the ‘high uptake’ category for OpenLibr@ry facilities. These categories are defined in Table 3 and were applied to a number of explanatory factors in attempting to account for the variability in students’ use of on-line resources in their studies during 2002.

Table 3 About Here

Contextual factors – rather than student characteristics – were examined because approaches to study describe the relation between the learner and the object of learning within a particular context. Ramsden (1998) maintains that students’

approaches are intimately connected to their perceptions of the context of learning, which includes the assessment requirements, workload and the teaching effectiveness.

The results were analysed using the chi-squared test for independence. Statistics textbooks often caution against the use of this test when the observed frequencies are small or when the frequencies expected under the null hypothesis of independence are small. In fact, however, the chi-squared test remains robust even under these circumstances. This has been well established in the case of 2 x 2 contingency tables (Richardson, 1994), but it is also true in the case of larger contingency tables (Bradley *et al.*, 1979). The test does become markedly conservative with small sample sizes when the different levels of the row or column variables are not equiprobable, and so researchers need to be cautious when interpreting nonsignificant results. Nevertheless, in this situation one can be confident about accepting any outcomes that do achieve statistical significance.

Factor 1: Differing levels of ICT access and use in faculties

As mentioned earlier, some UKOU faculties offer more courses that *require* students to access and use ICT than others. It might be anticipated that students taking courses in those faculties with a 'higher' level of ICT access and use would be more likely to use on-line resources and facilities than those students taking courses in faculties with a 'lower' level of ICT access and use.

Does the survey data support this hypothesis? Table 4 presents the data in terms of the 'high' or 'low' categories of uptake and 'high' or 'low' levels of ICT access and use in faculties. Statistically, the results are not at all significant, indicating that the general level of ICT access and use in a faculty **does not** provide a satisfactory indicator of whether or not students make use of on-line resources and facilities.

Table 4 About Here

Factor 2: Course requirement for students to have ICT access

It could be the case that regardless of the general level of ICT access and use in a particular faculty, students taking specific courses that *require* (or *strongly recommend*) the use of a computer will make more use of on-line resources and facilities than those students taking courses for which there is no ICT requirement. Students taking such courses are expected to use course-related software and/or engage in on-line communication as essential study components. They might also be referred, via a course website, to on-line library or information resources.

Table 5 presents the data in terms of the 'high' or 'low' categories of uptake for courses with or without a requirement or strong recommendation for ICT access.

Table 5 About Here

The data indicates that a specific course requirement (or strong recommendation) for ICT access is statistically significant in the case of OpenLibr@ry use, but is not significant in respect of using ROUTES facilities. Students taking these courses are using ICT on a regular basis for their studies, but this factor does not in itself seem sufficient to account for whether or not they access on-line resources.

Factor 3: Course level

It is often assumed that students at advanced levels of HE study are more self-directed in their learning. Experienced learners are likely to exhibit greater independence in learning and to exert greater control over what and how they study in order to achieve the desired learning outcomes and their own personal goals. On this basis, we might expect students taking high-level undergraduate courses and those seeking postgraduate qualifications to seek information and resources from libraries and other sources to a greater extent than those students in earlier stages of undergraduate study.

Data is presented in Table 6 in terms of the ‘high’ or ‘low’ categories of uptake by three course levels (1st and 2nd level, 3rd & 4th level and postgraduate). Statistically, the results are not significant, so level of study does not seem to provide a good indicator of whether or not students use the on-line OpenLibr@ry or ROUTES facilities.

Table 6 About Here

Factor 4: Pedagogic design of courses

There are great variations in the pedagogic design of Open University courses, both within and between academic units. The published course descriptions and/or Course Guides were scrutinised to identify aspects or features that provided evidence that (a) students were expected to make significant use of libraries or other sources of information, and/or (b) students’ use of on-line resources and facilities was an essential or highly recommended part of the course. The following features were identified.

Dissertation or extended project courses: These include postgraduate and higher level undergraduate courses that enable students to undertake inquiries and research leading to the preparation of a dissertation or extended project. Postgraduate students typically undertake supervised research leading to the preparation of a dissertation of 10,000 to 15,000 words. Fourth level undergraduate students undertake some course work before completing a substantial project element (5,000 to 6,000 words) as the final assignment.

Six of the ‘high uptake’ courses were of this kind – 5 were postgraduate dissertation courses and one was a project course at level 4. There were no such courses in the ‘low uptake’ category for OpenLibr@ry or ROUTES facilities.

Courses with a project element: In addition to assessed course work, students undertake an investigation or complete an important project component. Typically, projects of this kind involve preparing a literature review, working with primary sources or undertaking empirical studies. For example, such courses in the Arts Faculty indicate that students “must have access to a research library or a very large public or private library”, and with individual courses indicating that access to a specialist archive or collection might also be necessary.

Ten of the ‘high uptake’ courses were of this kind – all were postgraduate courses. None of the courses in the ‘low uptake’ category for OpenLibr@ry or ROUTES facilities were of this kind.

Courses which explicitly specify the use of on-line information resources: These are at all levels of study. The common feature here was that explicit reference is made to the use of ‘external’ on-line information resources (i.e. not directly provided as part of the core course materials). For example:

- A level 1 undergraduate course about health and social care (with on-line tuition) which includes “a project exploring the potential of care-related information on the world wide web”;
- A level 2 technology course about ICT includes a personal project “which makes extensive use of WWW resources and which forms the examinable component of the course”;
- A level 3 management course for which the description specifies “using the Internet to search for information” and indicates that in the latter part of the course “the emphasis is on developing your ability to undertake independent research using information searches and research methods”;
- A postgraduate science course that aims to enable students to “use electronic means of communication and search and retrieve information” and to “assess secondary literature and primary literature about addiction and ageing”.

Seven of the ‘high uptake’ courses were of this kind – three were postgraduate courses and four were undergraduate courses. There were no courses with explicit reference to the use of on-line resources in the ‘low uptake’ category for OpenLibr@ry or ROUTES facilities.

There were two further courses in the ‘high uptake’ categories (one for OpenLibr@ry and one for ROUTES) that could not be associated with any of these three course features. They did not involve a dissertation or a significant project element. Although they both required students to have access to a computer and the Internet and provided links from the course website, inspection of the Course Guides did not reveal any explicit references to use of external resources other than on an ‘optional’ basis. The data is summarised in Table 7.

Table 7 About Here

In terms of these pedagogic features, the results were statistically highly significant for use of both OpenLibr@ry and ROUTES facilities.

Discussion

The survey data indicates that UKOU students are not averse to accessing resources on the World Wide Web for that might be of value in their studies. All students taking any course with an ICT *requirement* will use computing equipment on a regular basis for their studies. However, the extent to which students use the university’s on-line library facilities, particularly the maintained ‘gateways’ for specific courses or disciplines, varies dramatically across all the surveyed courses. This raises several related issues that need to be considered further.

Integrated or optional use?

The data presented here supports the existing evidence that simply making resources available for students to use is not sufficient to ensure their uptake (Calverley & Shepard, 2003; McDowell, 2002). Inspection of the course descriptions and materials revealed that for many of the undergraduate courses (and some of those at postgraduate level) the links to on-line resources were for *optional* further reading. In contrast, wherever links to on-line resources were included as an integral part of course activities (e.g. for specified activities, for project work or for critical analysis of primary sources) they were much more highly used by students. None of the courses that specified how on-line information resources were to be used in course activities were in the ‘low’ uptake category.

The *optional* nature of many links to on-line resources is clearly a disincentive to greater use. Other studies with UKOU students (see Kirkwood, 2003) indicate that materials and activities that are embedded within the pedagogy of a course are perceived as being integral to the course and are much more likely to be used than those that are not. Students' perceptions of the *educational benefits* derived from using ICT in their studies are more significant than the intrinsic characteristics of any particular medium, materials or resources. For part-time learners, work or domestic responsibilities usually have a higher priority for their time and attention than do their studies. Very often, the limited amount of study time they have available is insufficient for all course materials and resources to be studied to the extent anticipated by the course designers.

Students have to be selective to survive in the system, and course assessment requirements are significant in guiding learners' choices. While a small proportion of learners seem to study *only* what is essential for assessment purposes (*assignment focussed*), a much larger proportion confess that assignments do influence their study behaviour (*assignment conscious*) (Kirkwood, 2003). This corresponds to research in a face-to-face university context (Miller and Parlett, 1974) which identified the extent to which students were *cue-seekers*, *cue-conscious* and *cue-deaf* in respect of indications given by teaching staff about likely assessment topics.

Students' selectivity is not simply a matter of *expediency* in response to limited time: very many develop a *strategic approach* as they take increased control of their learning. For materials and activities in any medium to be valued, they must be integrated within the pedagogy and aligned with the assessment strategy in order for students to engage fully with the range of learning opportunities offered. But 'integrated' (or 'embedded') must mean more than just 'assessed': it should signify that use of the materials or resources are a vital part of the teaching/learning process and that important course aims cannot be achieved without it (Biggs, 1999).

Developing 'information literacy' skills

The main advantage that students derive from using maintained 'gateways' or recommended links to web-based resources is that the sites to which they are directed have been evaluated and selected for their quality and suitability in terms of various factors, including being up-to-date, being at an appropriate educational level, and having sufficient authority and accuracy. They might also give access to sites with restricted access or databases that are normally invisible to general search engines (Bergman, 2001).

When students use a familiar Web search engine, they are likely to be presented with a long and undifferentiated list of 'hits'. Making effective use of this 'surfeit of riches' necessitates a considerable input from learners, who must browse and evaluate the many identified links in order to distinguish potentially appropriate sites from the larger number of inappropriate ones. In addition, very many relevant and valuable resources might be missed because they do not contain the chosen search terms or are not accessed by the search engine.

Developing and refining *information literacy* skills should be an important element of courses making much use of ICT, because few undergraduate students are well prepared for such activities (Macdonald *et al.*, 2001; McDowell, 2002). However, information literacy skills are not totally generic: they must be developed in the context of a specific subject or discipline because a basic understanding of any

discipline is necessary to enable learners to frame pertinent questions with which to evaluate and select appropriate sources.

Cultural change in teaching and learning

Even when most people have easy access to the Internet and there are well-developed archives and collections of appropriate on-line resources available for HE, those resources are likely to remain little used unless there is a change in the conception of the education process – from learner *dependence* (the largely passive transfer of subject knowledge) to learner *independence* (increasingly active meaning-making). This implies a shift in the locus of control from the teacher towards the learner – with teachers acting as facilitators rather than as gatekeepers.

McDowell’s study (2002) indicated that while some teachers were worried about students’ abilities to make judgements about the appropriateness of the on-line resources they might access, there were also “concerns ... expressed about judging the quality of students’ work if they drew upon unknown and unregulated information resources” (p. 262). Similarly, the notion that UKOU students had no need to go ‘outside the box’ in order to complete their course assignments is still rigorously applied for many UKOU courses: course teams and tutors actively discourage the practice. What had originally been implemented as a mechanism for overcoming the disadvantage to learners of their location or circumstances has come to be used to control what counts as acceptable learning.

While numerous academics in HE will find it necessary to reassess their approach to teaching and learning in the 21st century, so too will many learners. A different role in the process of learning will have to be adopted by those who have spent many years being ‘dependent’ in the school system. As Macdonald *et al.*, pointed out (2001, p. 431): “Even if students possess the necessary practical IT skills, they are unlikely to study effectively unless they are committed to the benefits of learning in this way”. There is no simple association between students’ use of ICT and the adoption of an active approach while taking greater control of the process of learning.

Conclusions

This article has argued that the extent to which students use ‘external’ on-line resources is closely related to the pedagogic design of courses and to assessment requirements: it is not just a matter of having good access to ICT and large collections of quality on-line resources available via the World Wide Web. Strategies for promoting lifelong learning and increasing learner autonomy – currently proposed as desirable outcomes for HE – also require the development of appropriate information-handling skills and a cultural change in respect of the educational model espoused by many teachers and learners in HE.

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Table 1: Proportion of UK adults who by end of 2002 had accessed the Internet at any time (Source: National Statistics, April 2003)

	%
All Adults	62
Age Group:	
16-24 years	95
25-44 years	81
45-54 years	64
55-64 years	45
65 and over	15
Sex:	
Men	66
Women	58

Table 2: Students' Access to a Computer and to the Internet in 2002, by Academic Unit (Source: Open University Courses Survey, November 2002)

Academic Unit	Computer Access %	Internet Access %
Arts	86.0	78.4
Social Sciences	93.0	84.7
Education	93.9	88.1
Health & Social Welfare	88.6	79.6
Languages	83.2	79.4
Management	99.0	98.3
Mathematics & Computing	96.2	89.5
Science	96.3	91.5
Technology	94.2	91.7
Overall	91.9	85.9

Table 3: Definitions of the Categories ‘High uptake’ and ‘Low uptake’ in respect of OpenLibr@ry and ROUTES facilities.

Category	Criterion	Number of Courses Included
‘High uptake’ of OpenLibr@ry facilities	All courses for which 50% or more of respondents had made <i>any use</i> of the on-line library facilities.	24 of the 122 surveyed courses.
‘Low uptake’ of OpenLibr@ry facilities	All courses for which less than 10% of respondents had made <i>any use</i> of the on-line library facilities.	9 of the 122 surveyed courses.
‘High uptake’ of ROUTES facilities	All courses for which 50% or more of respondents had made <i>any use</i> of the ROUTES facilities.	11 of the 61 surveyed courses with ROUTES pages.
‘Low uptake’ of ROUTES facilities	All courses for which less than 10% of respondents had made <i>any use</i> of the ROUTES facilities.	7 of the 61 surveyed courses with ROUTES pages.

Table 4: ‘High uptake’ and ‘Low uptake’ of OpenLibr@ry and ROUTES facilities, by overall level of ICT access and use in academic unit.

	Use of OpenLibr@ry facilities		χ^2	<i>p</i>
	‘High uptake’	‘Low uptake’		
Faculties with HIGH levels of ICT access and use	5	4	.64	.423
Faculties with LOW levels of ICT access and use	8	3		
	Use of ROUTES facilities		χ^2	<i>p</i>
	‘High uptake’	‘Low uptake’		
Faculties with HIGH levels of ICT access and use	2	4	1.33	.248
Faculties with LOW levels of ICT access and use	4	2		

Note: $df = 1$ in both cases. *p* is the probability of obtaining the observed results or more extreme results under the null hypothesis of no association.

Table 5: ‘High uptake’ and ‘Low uptake’ of OpenLibr@ry and ROUTES facilities, by course requirement for ICT access.

	Use of OpenLibr@ry facilities		χ^2	<i>p</i>
	‘High uptake’	‘Low uptake’		
Course requires ICT access & use	14	1	5.89	.015
Course DOES NOT require ICT access & use	10	8		
	Use of ROUTES facilities		χ^2	<i>p</i>
	‘High uptake’	‘Low uptake’		
Course requires ICT access & use	8	4	.47	.494
Course DOES NOT require ICT access & use	3	3		

Note: $df = 1$ in both cases. p is the probability of obtaining the observed results or more extreme results under the null hypothesis of no association.

Table 6: ‘High uptake’ and ‘Low uptake’ of OpenLibr@ry and ROUTES facilities, by level of course.

	Use of OpenLibr@ry facilities		χ^2	<i>p</i>
	‘High uptake’	‘Low uptake’		
Course at Levels 1 or 2	4	5	5.47	.065
Course at Levels 3 or 4	2	1		
Postgraduate Level	18	3		
	Use of ROUTES facilities		χ^2	<i>p</i>
	‘High uptake’	‘Low uptake’		
Course at Levels 1 or 2	3	5	3.70	.157
Course at Levels 3 or 4	2	1		
Postgraduate Level	6	1		

Note: $df = 2$ in both cases. p is the probability of obtaining the observed results or more extreme results under the null hypothesis of no association.

Table 7: ‘High uptake’ and ‘Low uptake’ of OpenLibr@ry and ROUTES facilities, by pedagogic design of course.

	Use of OpenLibr@ry facilities		χ^2	<i>p</i>
	‘High uptake’	‘Low uptake’		
Dissertation or extended project	6	0	28.46	.000
Significant project element	10	0		
Explicit reference to use of resources	7	0		
Unspecified	1	9		
	Use of ROUTES facilities		χ^2	<i>p</i>
	‘High uptake’	‘Low uptake’		
Dissertation or extended project	2	0	14.32	.000
Significant project element	2	0		
Explicit reference to use of resources	6	0		
Unspecified	1	7		

Note: $df = 3$ in both cases. *p* is the probability of obtaining the observed results or more extreme results under the null hypothesis of no association.

Figure 1: Proportion of Courses Survey 2002 Respondents that had used OpenLibr@ry facilities.

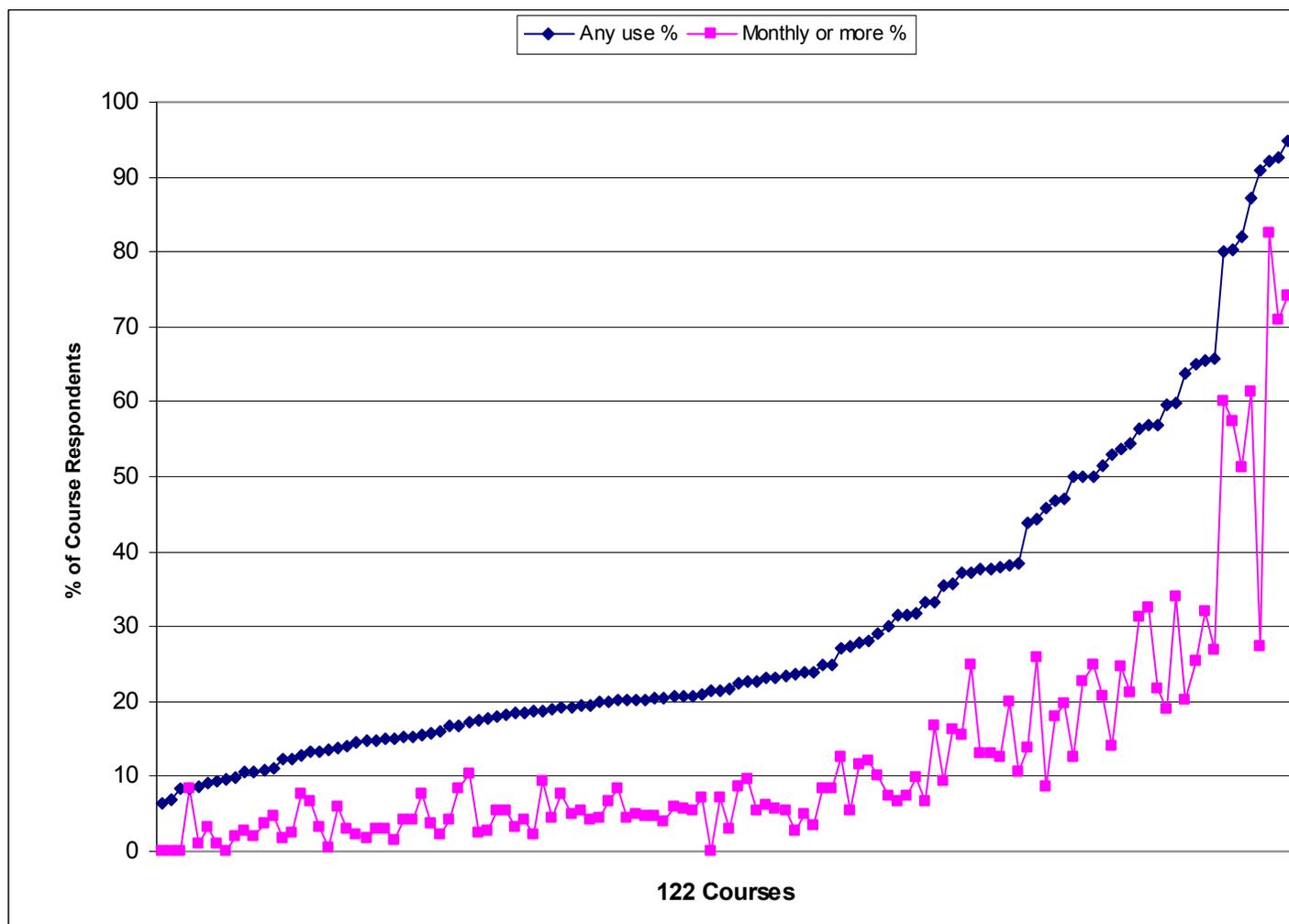
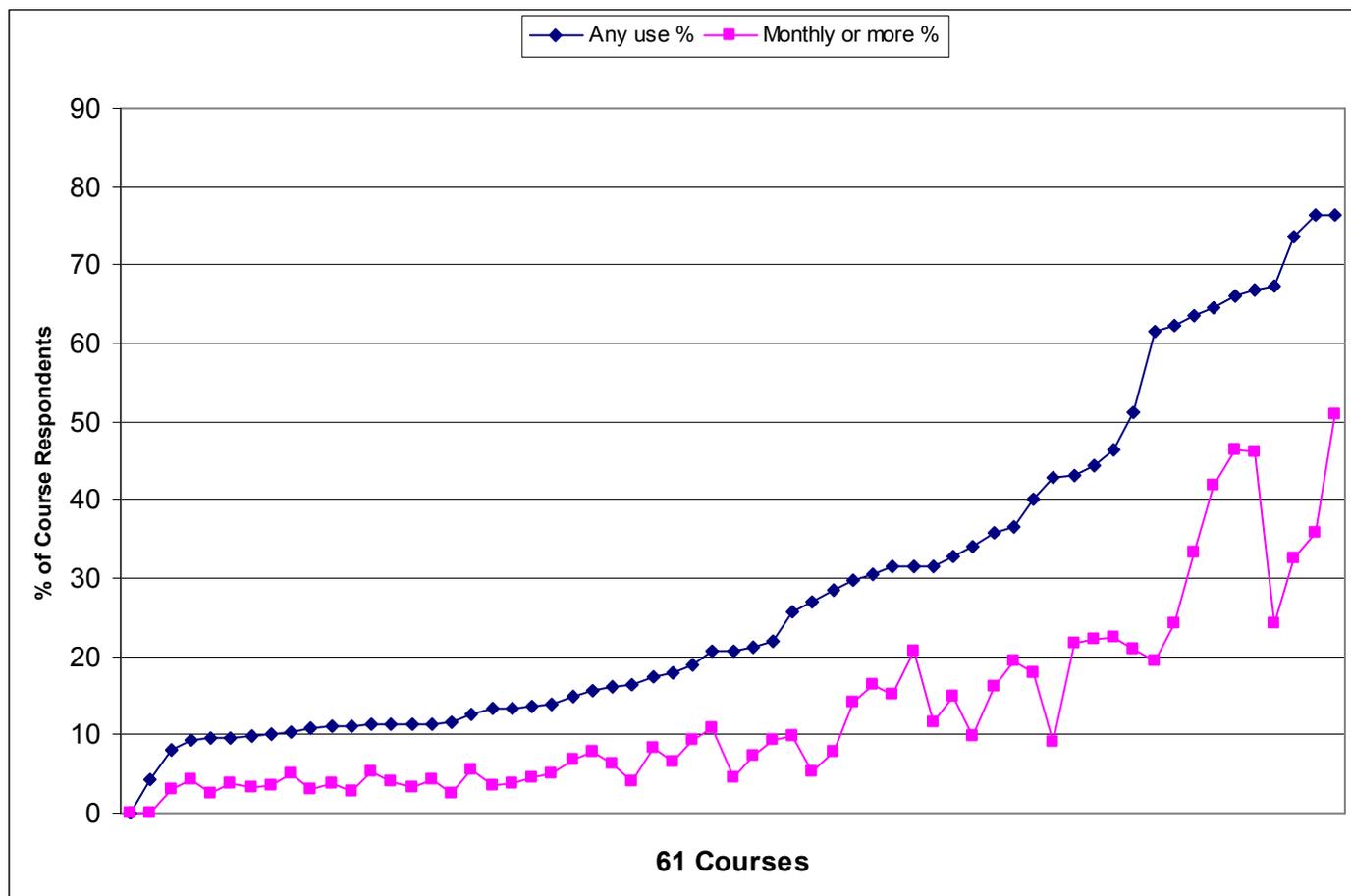


Figure 2: Proportion of Courses Survey 2002 Respondents that had used ROUTES facilities



Biographical Information

Adrian Kirkwood is a Senior Lecturer and Head of the Programme on Learner Use of Media in the Institute of Educational Technology at the UK Open University. He has been monitoring and evaluating developments in media-based teaching and learning for over 15 years, both within the UK Open University and in other education and training organisations. These activities have resulted in a range of publications, and have provided the basis for a series of professional development workshops that have been run in a number of educational institutions in the UK and in other parts of the world.

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