Understanding practitioners perspectives of course design for distributed learning

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Abstract

This paper presents the findings from a study investigating current practice in course design at the UHI Millennium Institute in the Highlands and Islands of Scotland. The issues considered include choice of communications media, limitations in use, and course design approaches. The paper concludes that a model utilising five dimensions of flexibility is a good conceptual base for the analysis of distributed learning courses. A mix of educational technologies is the preferred model in the survey and is an essential component of good teamwork when the course designers are not co-located. There was general agreement amongst respondents that a mix of technology-based education encourages flexibility in accessing resources and promotes self-directed learning by students.

Keywords

elearning, distributed learning, course design, flexibility, self-directed learning.

Topics

Introduction

The Research Issue

This review of some of the literature on blended learning and distributed learning suggests that course design should be student-centred, provide a flexible, interactive and dynamic learning environment yet have a rationale for the choice of media and methods used on the course. Sharp et al (2006 p 3) in a comprehensive review, found that "student response is overwhelmingly positive to the provision of online course information to supplement traditional teaching.". Individual case studies and evaluations of distributed learning courses abound in the literature (e.g. Matheos & Archer 2004; McConnell et al 2004; Langenbach & Bodendorf 1997), but remarkably few of these articles have a central focus on the design process, most preferring to report on student or faculty satisfaction with the results of the 'delivery' of a course or module. The research described here aimed to discover how course design for distributed learning takes place in practice. What rationale determines media choice? What assumptions do course designers make about students' readiness to engage with particular media? What implications are there in terms of student support?

The Context

The UHI Millennium Institute in the Highlands and Islands of Scotland is a distributed Higher Education Institute spread over 15 academic partners and more than 50 local learning centres, covering in excess of 40,000 km^2 of northern Scotland, including over 90 inhabited islands and some of the most sparsely populated corners of mainland UK. Since 1993, the UHI has focused on bringing higher education opportunities to people in geographically dispersed locations throughout the Highlands and Islands of Scotland, and by recent extension, to other parts of the UK and Europe. These students are typically cast as 'remote students' (i.e. remote from the main teaching campus, but the essential point is that students do not need to leave their home area in order to pursue their studies.. As a federated network of 15 existing colleges and research centres, it is spread over a very wide geographical area with the second lowest population density in Europe. There is no university actually located within this large region, although a number of of Higher Education institutes have supported students in the region through distance and distributed learning. UHI offers access courses in further education and vocational training, right through to undergraduate and postgraduate degrees. There is some specialisation of subjects by the different colleges, but most degree courses are delivered jointly across the UHI network. This means that the aim of networked courses is to ensure that wherever the student is located, a range of courses can be studied. For these reasons, distributed learning (as defined below) represents and attractive solution to enable the UHI to deliver diverse formats of educational resources (usually, but not always, digital) throughout the region. A key characteristic of UHI is therefore the networking of courses, such that students in any location can study courses delivered from other parts of the network that are offered using a range of advanced technologies that can supplement or replace face-to-face tuition. Furthermore, UHI aims to be responsive to the local (region-specific) context in its choice of curriculum and research focus. Examples of this would include the Masters Degree in Managing Sustainable Rural/Mountain Development and the undergraduate programmes in Gaelic and North Atlantic Studies, or Rural and Remote Health Studies.

From this context it can be seen that the UHI has a strong interest in the support of distributed learning systems that are flexible enough to permit easy access to multi-mode educational resources, over a wide geographical area, to small rural communities on islands and mountainous locations. Even in a higher education institution such as this, however, there is a great diversity of perception of the definition,

function, and design of distributed educational resources, so a short synthesis of some relevant literature will serve to provide clarity on the common ground. Amongst the plethora of definitions of distributed learning, there is little common ground. For some, the practice is synonymous with distance learning and elearning (e.g. Oblinger *et al* 2001); for others it is identical to the term blended learning (e.g. Bonk & Graham 2006). While blended learning is also a contentious term, it generally refers to a combination of face-to-face and online learning (such as using elearning to complement classroom activity or vice-versa). A recent study into the undergraduate experience of blended e-learning in the UK (Sharp et al 2006) comprehensively explored recent literature and practice, to come up with some key "recommendations to guide future policy, practice, and research." This report forms important background reading to the present paper, but a slightly wider interpretation is taken here to accommodate the fact that a) blended learning may take place on one campus (i.e. without necessarily any geographical distribution) and b) distributed learning, although combining distance and elearning, may not necessarily include any face-to-face activity (as is normally implicit in the term 'blended learning').

For the purposes of this article, we will assume the following properties define distributed learning:

- The components of the course are distributed across multiple media and this tends to imply a certain amount of choice of media as well as a tendency towards supporting a student-centred learning approach (Vovides et al, 2007).
- Distributed learning can be used to augment traditional classroom-based courses, to deliver distance education courses or to create wholly online courses.
- Providing flexibility for students in terms of time and/or location of study is one key aim of the pedagogy of distributed learning.

Schematically, the relationship between blended learning, elearning, and distributed learning can be illustrated by the following diagram. Note that face-to-face tuition can form a component of a blended learning course but not a distance learning course as, strictly, the co-location required by face-to-face tuition is mutually incompatible with teaching at a distance (i.e. the introduction of face-to-face tuition to a distance learning course transforms it, by default, into blended learning.

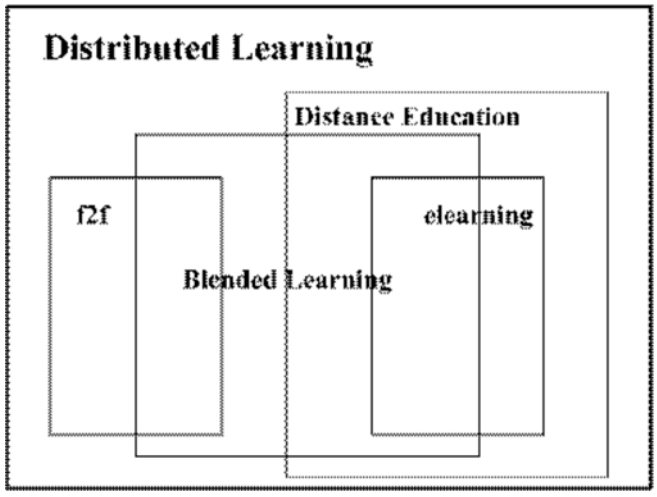

Figure 1. The relationship of elearning to distributed learning (Mason and Rennie 2006 p xvii)

The apparent lack of consistency amongst the various definitions can be explained by the fact that distance education and campus-based teaching are converging due to the growth of ICT and the web, as well as the growing student demand for flexible learning options (Tait & Mills 1999). A number of universities that introduced online courses as a way of attracting new learners, have found to their dismay that their campus students opt for these courses, often creating their own blend by taking one online course plus several face-to-face courses (Young 2002). Across the sector, provision is moving towards a pattern characterised by short intensive face-to-face interventions punctuating longer periods of independent or group study facilitated by learning technologies (Middlehurst 2002). Distributed learning has arisen as a term which bridges educational practice from face-to-face to distance learning (Lea & Nicoll 2002). The availability of new learning technologies, both synchronous and asynchronous, has added depth and richness to the potential of distributed education. The UHI is a very heavy user of videoconferencing for Higher Education and also hosts is own online learning environment (VLE) that combines asynchronous (discussion boards, email, tutorial resources, online libraries) with synchronous (instant messaging, Skype audio and video) interaction between tutors and students. New communication tools such as Instant Messaging, Skype shared whiteboard technologies, and reflective tools such as blogging, wikis, and eportfolios have been added to long-established means of asynchronous communications (print, email, discussion boards etc.) to become part of the distributed learning designer's palette of options in creating dynamic and varied educational environments.

Self-regulated Learning

According to existing literature, one of the key factors in designing courses with a high level of flexibility must be the development of a student-centred, rather than teacher-centred learning environment (Meyers and Jones 1993; Motschnig-Pitrik and Holzinger2002; EIC 2004; Gudmundsson & Matthiasdottir 2004). Based on constructivist theories of learning, student-centred approaches to course design create an environment in which learners discover or work out for themselves an understanding of the subject or concept through critical analysis and reflection, often in conjunction with other learners. By combining a range of media and communication modes, the course no longer consists of one authorised version of knowledge such as is conveyed by a lecture or a textbook. The resources of the web, the interactions with other learners, the guidance of the teacher, and the experiences resulting from collaborative activities all combine to effectively distribute the inputs of the course so that the onus shifts to the student to construct their own understanding of the topic. Relan and Gillani (1997) confirm this analysis of the impact of distributed education:

"The predominant source of content shifts from the textbook and the teacher to a more varied source of information. Further, the nature of the content becomes dynamic, versus the static texts published on a certain date." (Relan & Gillani 1997: 44)

The role of the teacher or tutor is to generate an infrastructure for constructive interaction and to help students individually and collectively to negotiate their own meaning. The course designer, who may or may not be the same as the teacher or tutor, needs to understand the strengths and weaknesses of available technologies and to know something about the background of the potential students, and about students' expectations (Lohnes and Kinzer, 2007). Even with this understanding, it is still problematic for course designers to decide what components to use and where to start.

A key component in the provision of a variety of different educational resources is to allow the students to enhance their cognitive self-regulation, and Vovides et al (2007, section 6.4) summarise this as meaning that a course management system "should inspire, motivate, and guide students to develop self-regulated learning cognitive skills. This means that students are guided to play an active role in learning, become self-organized, and independent, and actively participate in the learning process to construct their knowledge." Later they conclude that "e-learning environments within a CMS should address learners' diversity in terms of metacognitive skills, learning styles, prior knowledge, and cultures" (ibid, section 10.) The skill in the design of distributed learning is to match the learning objectives of the 'course' to the learning needs of the students, using appropriate media and individually relevant educational resources. Anecdotal evidence, however, suggests that many courses are technology-led; that is, a new piece of software appears to be gaining followers, so the course designers decide to 'have a go with it'. This can result in technologies being peripheral to the core content of the course. Students immediately detect this and avoid engaging at all or only superficially with this component. In some cases communication technologies are used on a course where only a proportion of students have access.

In a practical guide for the UK Quality Assurance Agency, Casey and Wilson (2006) provided a theoretical and practical framework to consider flexible learning in the context of Further and Higher Education, and this is also a good conceptual starting point for investigating the flexibility of distributed learning. In particular, the "five dimensions of flexibility" proposed by Collis and Moonen, (2004) formed a useful framework to formulate the questions for staff interviews and could perhaps be further developed as an empirical tool for quantifying the level of flexibility of distributed learning courses.

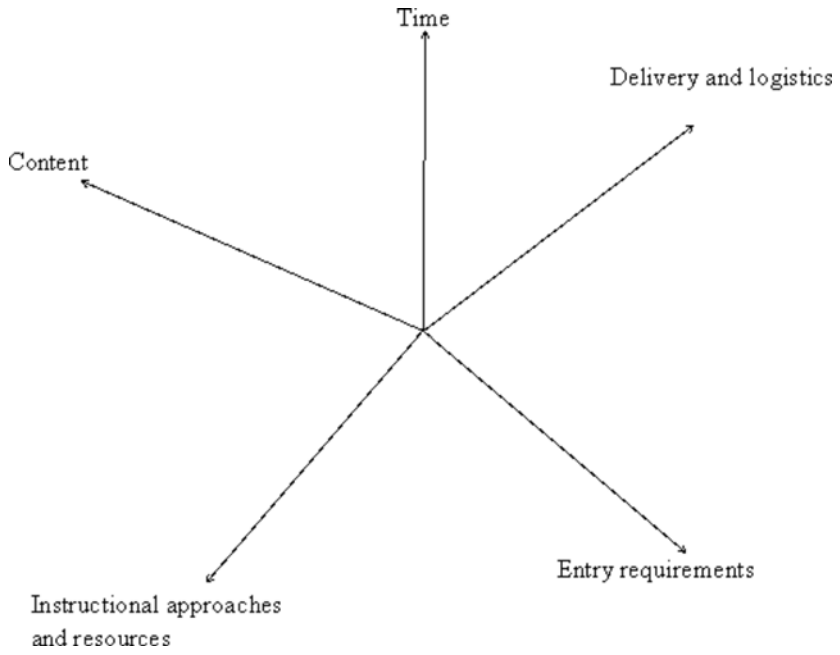

Figure 2. The five dimensions of flexibility (Source: Collis and Moonen, 2004)

In this context also, it is worth considering the proposed model for analysis and implementation of flexible programme delivery offered by Normand and Littlejohn (2006) although they acknowledge the fact that that their selected case studies reflect an "instructor-offered flexibility" rather than a more comprehensive institutional approach.

Measuring the learning experience

It is well established in academic literature that a considered approach to designing distributed learning courses is to begin with learning outcomes.

> "As we become more learner-centered, instructors move from covering content to helping students master learning outcomes. This transition can have profound impact on how faculty structure their courses and curricula, and generally leads to increased interest in depth of processing rather than breadth of coverage." (Allen 2004)

Learning outcomes are specific understandings or skill sets that a student is expected to achieve at the end of a learning experience. They can be applied to a course, a programme, or a complete degree. The use of learning outcomes as the focus of course design provides a rationale for the selection of resources and media.

> "Outcome-based education is a method of teaching that focuses on what students can actually do after they are taught. All curriculum and teaching decisions are made based on how best to facilitate the desired outcome. This leads to a planning process in reverse of traditional educational planning. The desired outcome is selected first and the curriculum is created to support the intended outcome." (Lorenzen 1999)

The use of learning outcomes as a starting point for course design generally has become standard practice in UK higher education in recent years (QAA 1999). At least four factors are implied in this approach:

- What the student is to learn must be clearly identified.

- This must be achievable and demonstrable.
- The course should provide multiple instructional and assessment strategies in order that each student can demonstrate what they have learned.
- The course design must allow adequate time and provide adequate assistance so that each student can reach the maximum potential (Towers 1996).

This raises the difficulty, however, that the encouragement of a diverse range of learning resources, and the promotion of highly student-centred learning, does not sit well with the rigid definition of the 'successful' or 'acceptable' learning outcomes solely by the tutor prior to the start of the course. The recognition of flexible, student-regulated ways of learning would also seem to imply a greater student say in the value of the learning outcomes and a shift in the power relationships between tutor and learner. Delialioglu and Yildirim (2007) claim that "the design, development, and implementation processes for a blended learning environment are different from those in a purely traditional, face-to-face course or a purely web-based course", (p 144) and they identified a number of factors relating to the effective dimensions of interactive learning by students, including student motivation, metacognitive support, authentic learning activities, and opportunities for individualised learning.

This paper focuses on what choices are being made by practitioners and for what reasons. How do course designers decide what technologies to use? What considerations underpin their design solutions?

Methodology

A short pilot questionnaire, consisting of ten structured questions, was distributed to Course Leaders throughout the UHI, in order to survey their attitudes towards course design. The rationale for the questions in both the questionnaire and the following interviews was to probe the extent to which Course Leaders currently have utilised educational technology in their course, how had course teams selected these resources, and what was their experience of implementation. The respondents were asked to provide information through such questions as "What forms of communication does your course utilise for interaction between tutor/teacher and learners?" and "In your own context, for your students, what do you consider to be the optimum method of providing a good learning experience?" (both questions gave a selection of options) Respondents were also questioned on their use of new technologies by checking their level of agreement with a number of statements relating to relevant staff training, pre-course preparation, and their use of technologies during the delivery of their courses. A simple Likert scale of classification was used to categorise responses. The questionnaire was completed online using the software available at http://www.surveymonkey.com and all UHI Course Leaders, were emailed with a personalized note seeking their response. A total of 49 course leaders were invited and 40 responded. In addition, 10 of course leaders were selected at random for a more detailed, semi-structured interview to probe their current practice in the flexible design of courses and learning resources. The Course Leaders selected for interview were drawn from a pool of those who were self-identified from the questionnaire as experienced in the design of distributed learning resources and willing to participate in a follow-on interview. The online questionnaire was used to assess the broad, strategic picture of attitudes towards the use of distributed learning resources among UHI Course Leaders, while the smaller pool of structured interviews was utilised to follow up on some specific issues and the individual detail of the use of certain popular resources, such as the videoconferencing or the VLE, as well as issues that claimed to be course or discipline specific. Although the Course Leaders are key decision-makers and have an important function in relation to the overall design of their courses, there are two main limitations of this method. The first is that it relies upon the Course Leaders to summarise the attitudes of the course team as a whole and to provide a consistent overview, while from experience we can expect that, even within a close team, individual team members may have very different levels of experience, competence, and enthusiasm for different forms of educational technology. Secondly, the Course Leaders are middle management academics, and by job definition they are going to be more involved in the course design and delivery process that the majority of the 'rank and file' academic staff, so unless we survey the entire academic staff, the perceptions obtained cannot be truly reflective of the whole academic institution.

Analysis

Practitioners attitudes towards course design

Course designers were first questioned about current practices and attitudes (Table 1). Although this is an example of a networked higher education institution, with the institution having a number of inter-linked, geographically scattered campuses, there was still a high number (32%) of respondents who indicated that interaction between tutor/teacher and learners was mainly face-to-face. Nevertheless, nearly half indicated that they did not use a lot of face-to-face or never used it. While 63% reported that they used email a lot, or as their main means of course interaction, no-one claimed that they did not use it, and this contrasts sharply with more traditional means of contact, e.g. only 5% indicate that they mainly use distance-based print materials (30% never) and 8% mainly residential attendance (57% never) as compared with 35% who *mainly* use a Virtual Learning Environment (VLE) and a *further*30% who use the VLE a lot for tutor-learner interaction (only 12% never). Surprisingly only 3% use audio conference facilities as the main means of interaction (49% never and a further 32% indicate not a lot of use) and this contrasts against the higher level of technology required for videoconferencing (VC) where 10% regarded this as their main means of interaction, with a further 21% using it a lot (33% never, and 18% not a lot). The use of discussion boards for interaction was fairly evenly spread across all categories, but no-one claimed that very recent technology such as instant messaging, skype audio, or Vskype/netmeeting was a main means of communication to promote interaction.

Table 1. What forms of communication does your course utilise for interaction between tutor/teacher and learners?

	Mainly	A Lot	Some	Not a Lot	Never
Face-to-face	**32.5%**	15.0%	10.0%	25.0%	17.5%
Distance-based print materials	5.4%	13.5%	**37.8%**	13.5%	29.7%
Email	17.5%	**45.0%**	32.5%	5.0%	0.0%
Videoconference	10.3%	20.5%	17.9%	17.9%	**33.3%**

Audioconference	2.7%	2.7%	13.5%	32.4%	**48.6%**
Virtual Learning Environment(VLE)	**35.0%**	30.0%	10.0%	12.5%	12.5%
Online discussion board	**25.0%**	12.5%	15.0%	22.5%	**25.0%**
Instant messaging	0.0%	8.3%	2.8%	22.2%	**66.7%**
Skype audio	0.0%	2.8%	5.6%	2.8%	**88.9%**
Skype video or Netmeeting	0.0%	5.6%	2.8%	5.6%	**86.1%**
Residential attendance	8.1%	2.7%	16.2%	16.2%	**56.8%**
CD or DVD	2.7%	8.1%	24.3%	18.9%	**45.9%**
Other	4.3%	0.0%	26.1%	26.1%	**43.5%**

Although a high majority claimed never to use these media tools there was also a small but significant proportion of innovative courses that appear to be experimenting in their use, generally around 10-12% but rising to 22% with the introduction of instant messaging. The UHI is currently the biggest user of videoconferencing for Higher Education in Europe, and one course leader summarised as;

> "*I think it would be fair to say that the process of using vc [videoconferencing] is in a sense historical ....The VLE is something that has been added to the mix, and they have become more important over the years .... and that has changed the character of the vc sessions as well. They are now much less about broadcasting a formal lecture and are much more about discussion...."* [respondent 1]

Staff in the survey overwhelming agreed that "*the competent use of educational technology gives students better access to self-directed learning*", but there was less unanimity with regard to whether it gave students better access to tutors. The majority (84%) were in broad agreement that "*the competent use of educational technology gives students better access to tutors than 'traditional' (face-to-face) teaching systems*" (50% partially agree, 21% agree, 13% strongly agree). Only 2 course leaders (5%) disagreed strongly with this statement. There was a high expectation that "*students are expected to have a basic competence in using online resources*" (21% agree strongly, 37% agree, 29% agree partially) but also a recognition that "*students will also require some pre-course training*" (18% agree strongly, 50% agree, 29% agree partially). There was a general recognition of the "*expectation to provide a helpdesk support for students during the course*" (24% agree strongly, 39% agree, 26% agree partially).

When asked to "*consider the optimum method of providing a good learning experience for their own students*", the provision of a VLE was generally the most popular (33% would mainly use VLE, 41% would use it a lot and 21% would make some use of it) with 0% saying that it would never form part of their optimum solution. The use of email also featured strongly (42% would use some email, 32% a lot, and 18% mainly use email). Closely behind was a strong element of face-to-face (f2f) contact (34% prefer as a main use, 21% would use it a lot, and 26% would use some f2f). Significantly 18% said that they would use very little or no face-to-face interaction in their optimal tutorial mix. The nature of f 2f contact was not defined, (i.e. lectures, small groups, individuals) but 41% of course designers indicated that they would favour some residential attendance and a further 18% said that they would prefer this as a major or main method of providing a good learning experience. The use of videoconferencing seems a popular blend in this optimal mix, with 36% favouring some use, a further 21% suggesting a lot of use. Only 8% proposed that VC would be a main medium in promoting a good learning experience. Audio conferencing faired less well, with 38% saying that they would not use it a lot (16% never) and only 14% suggesting that it should be used a lot (no-one selected this as a main media). The use of newer technologies such as skype (audio and video) and instant messaging were much less popular with 59% indicating that they would never use skype audio and 53% never using skype video or Netmeeting. Very small numbers were in favour of using these media a lot or as main communication tools (generally around 10%) and this may partly reflect the ad hoc nature of these media as well as the comparative unfamiliarity that staff felt for this new technology. In contrast online discussion boards were popular (21% as a main use, 32% a lot of use and 32% made some use) as well as the distribution of CD/DVD resources (52% some use, 24% a lot of use).

As a general rule, the course designers appear to prefer a diversity of communications and resource tools rather than placing an over-reliance upon one or two media. The respondents have been very cautious in stating their main choice of communications media for providing a good learning experience for their students, the most popular being face-to-face (34%) followed by VLE (33%) and then discussion boards (21%) which are incorporated in the VLE. The least favoured options were generally the newer media (instant messaging, skype, Vskype, or Netmeeting) although this does not indicate a straight preference for face-to-face contact or residential attendance. In the supporting justification as to why tutors preferred their selected methods of interaction the most frequent open-ended comments emphasized three important factors;

1. The Learning Context – the situation of the student (and tutorial staff) needs to be appropriate. This includes the geographical location of the learner, and flexibility with their access, time, and work constraints.

   "*The type of students accessing this particular* [course] *need to be able to access materials as flexibly as possible due to more than 95% of them working at the same time as studying. This does restrict the technologies used- but in my opinion it does not disadvantage them.*" [respondent 2]

   "I don't necessarily think that face-to-face is better than videoconferencing. All methods can be good if the technology works and they are used wisely." [respondent 3]

2. Diversity – most staff interviewed were in agreement that a blend of methods is best and that effort should be taken to allow learners to select learning approaches that suit them best (although cost and compromise were also considered important).

   "I can access a wider group of people. Learning materials are prepared well and can be

easily updated, but [I] *would like a variety of contact for tutorials, dependent on the students needs i.e. if they can come in face-to-face , I see them (if numbers are viable) but if they can't,* [I] *use audio conference or videoconference, whichever is available. Finally, discussion boards log the comments permanently for students to review throughout the module."* [respondent 4]

"I don't necessarily prefer to deliver by VC and VLE but it seems to provide the best (most cost effective) compromise for geographically distributed students. Students and tutors alike agree that it is not a good way to teach Maths." [respondent 5]

3. Practicality – staff were generally not wedded to dogmatic solutions, and though they frequently acknowledged favourite media, they also stressed the need to maintain flexibility in delivery as well as ensuring the reliability of the chosen media.

"*I prefer these [*media*] because I think they help to generate meaningful interactions and keep constant contact with students, but it doesn't have to be by video – audio and the written word are sufficient. The human touch is still important*" [respondent 6]

In the context of designing a new distributed course, 64% of respondents agreed or strongly agreed that they would try to select the most appropriate delivery style for the student then write the course around those media. No attempt was made at this stage to identify how they ascertain the student opinion on what learners found most appropriate, but 41% of responding staff agreed that the method of communicating with students that they themselves were most comfortable with, was a key factor in their choice of media selection. No-one disagreed with this statement. We recognise that this may present an apparent contradiction and we propose to investigate this more closely as we pursue this field of research.

Before starting to teach their new course, 62% of course designers always "*provide an induction or training event for learners in the technology that will be used*" on the course (only 3% never provide any element of induction). There is a reasonably high expectation of prior technological skills among learners, with 28% expecting "*that learners will be technologically competent to access learning resources electronically"* before being accepted onto a course (36% often expecting this, 23% sometimes, 13% never). As perhaps might be anticipated, there is a high level of attention given to "*consideration of alternative forms of media for learning materials and activities*" at the course design stage (33% always, 38% often, 28% sometimes) with no-one claiming that this never happens. Surprisingly, however, only 26% state that they always "*assess the individual student's technology skills*" before the course is taught (54% sometimes).

There is a strong indication that the expectations of course designers have been conditioned, at least in part, by their own experiences of educational technology, with 49% agreeing and 15% strongly agreeing that their own "*educational environment encourages diversity and experimentation in the use of different learning resources*" (no-one disagreed strongly with this statement). This diversity and experimentation is supported by the fact that 46% agree and 28% strongly agree that they "*consider the manner in which students learn to be as important as what they learn*" (only 6% disagree or disagreed strongly). Responses to the questionnaire indicated that just over half of the course designers "*always evaluate the student satisfaction with the pedagogical mix*" (i.e. not simply their satisfaction with the course content) with a further 36% indicating that they at least partially consider this in their course evaluation. Perhaps through a combination of the circumstances above, there was a feeling that these Course Leaders "*consciously look for new ways of using technology to enable their students to understand better*". Most respondents agree that they have had some "*specific training in using the mix of technology that they currently employ*", though the questionnaire did not explore whether course designers had specific training in media and methodology that they subsequently chose ***not*** to use in their distributed course design. This is significant as it became unclear whether course designers did not include some new types of media (e.g. Skype audio/video) simply because they were aware of the appearance of new technologies that might aid them, or because they had tested them thoroughly and found the new media unsuitable. This aspect will be expanded upon in further interviews planned to extend the scope of this study.

A very high degree of agreement was indicated when respondents were asked to select the three most important aspects of distributed course design,

- 92% identified the need to have clear learning objectives,
- 61% emphasized the importance of understanding who the target learners are,
- 42% stressed the need to articulate clear skills and assessments in the course design process.

Of lesser, but still significant importance it was recognized that accommodating variations in students learning styles (29%) and the identification of resources to aid their teaching (26%) are important aspects of course design. Giving immediate feedback to learners (24%) and accommodating the variations in learners objectives (11%) as part of the course design are also worth noting. By contrast, this group of Course Leaders attributed relatively little importance to assessing prerequisite knowledge of the subject (5%) or of ICT (3%) or of controlling the order of course content (3%) or the pace of course delivery (3%). The ability to control resources available to learners was not regarded as being of any significant importance. Other comments re-emphasized the need to contextualise and maximise the flexibility of access to the course content, as well as seeking to ensure the relevance of the learning outcomes to individual learners.

Table 2. In your own context, for your students, what do you consider to be the optimum method of providing a good learning experience?

	Mainly	A Lot	Some	Not a Lot	Never
Face-to-face	**34.2%**	21.1%	26.3%	13.2%	5.3%
Distance-based print materials	5.4%	16.2%	**40.5%**	27.0%	10.8%
Email	18.4%	31.6%	**42.1%**	5.3%	2.6%
Videoconference	7.7%	20.5%	**35.9%**	28.2%	7.7%
Audioconference	0.0%	13.5%	32.4%	**37.8%**	16.2%

Virtual Learning Environment (VLE)	33.3%	**41.0%**	20.5%	5.1%	0.0%
Online discussion board	21.1%	**31.6%**	**31.6%**	10.5%	5.3%
Instant messaging	3.0%	12.1%	12.1%	**39.4%**	33.3%
Skype audio	3.1%	9.4%	9.4%	18.8%	**59.4%**
Skype video or Netmeeting	10.0%	0.0%	13.3%	23.3%	**53.3%**
Residential attendance	8.8%	8.8%	**41.2%**	11.8%	29.4%
CD or DVD	3.0%	24.2%	**51.5%**	18.2%	3.0%
Other	5.9%	0.0%	11.8%	35.3	**47.1**

Limitations of course design

Consideration of the three most significant limitations in the current design of courses, in order to facilitate effective distributed learning, produced rather less unanimity of response. The top response was,

- The limitation of making appropriate resources available to all learners (53%) followed by,
- The difficulties in ensuring the equivalence of the learning experience (45%)
- Limitations on the ability of learners to cope with the demands of technology (29%) came next (though this would suggest clearer course specifications and more care to pre-assessment of ICT skills and course induction training).
- The limitations in being able to provide appropriate feedback in time were considered important by around a quarter of all respondents (26%).
- Of equal concern in this study were the limitations on the reliability of internet technology, delivery costs, and support costs (all at 24%).
- Providing depth in feedback, and keeping track of learners' progress were also, to some extent, recognized as potential limitations in current course design for distributed delivery (both at 11%)

In response to an invitation for an open-ended comment on limitations in current course design, three other main concerns were raised;

- **Time** – the availability of adequate time for course preparation and delivery, as well as juggling timetables with conflicting demands. Comment was also made on adequate staff time required to learn appropriate technology based teaching methods.
- **Specific media** – some concern was raised regarding specific media, e.g. videoconference links and booking system or modifications to the institutional VLE, as well as common procedures and effective communication.
- **Peer support** – Significantly, several comments related to the need to focus on an effective system of course design for distributed learning that encourages flexibility and trust between members of the programme team. Among the most significant limitations, the following were mentioned;

  "*The myth that a lecturer has all the skills required to develop an online course. It requires a team*." [respondent 9]

also the recognition that

> *"*[Some*] course teams are distributed and they don't work effectively together to provide an integrated product."* [respondent 10]

Potential reasons for the inability of a course team to effectively work together include,

> *"Programme team inflexibility and unwillingness to engage in new design; non-collegial approach to programme delivery (i.e. a niche product should not be networked as [*college X*] will lose out."* [respondent 11]

Clearly the ability to learn and collaborate in a distributed manner needs to be practiced as well as preached by academics who have serious aspirations to improve the design and application of educational resources for distributed learning.

Conclusions

This study has examined course design practices in the UHI Millennium Institute and several conclusions can be drawn from the data collected:

Firstly, the model of Collis and Moonen (2004) is reinforced as a good conceptual model on which to base an analysis of distributed learning courses as their "five dimensions of flexibility" correlate very closely with the main issues raised by Course Leaders relating to the educational technology requirements of their courses.

Secondly, the use of anticipated learning outcomes would seem to provide a clear focus for course design that enables Course Leaders to more easily match curriculum requirements to educational technology that is appropriate to learners' personal requirements. There is a conflict, however, between student-centred learning where learners are encouraged to explore their own paths and valuation of learning when the measurement of 'successful learning' is pre-defined by set learning outcomes before the student even embarks upon the course.

Third, a key objective in providing more flexible access to educational resources is to provide a mix of different technologies and communications media in order to encourage a higher level of self-directed learning by students. In this study it is also the preferred means of ensuring a level of equivalence in the learning experience, especially when students are located over a large geographical area.

Fourth, the incorporation of a face-to-face induction event for new students, even for otherwise fully

online courses, was identified as an example of good practice to ensure that learners can attain a level of competency and comfort with the educational technology requirements of their course. It also helps learners to make more informed choices about when and how to use different educational technologies.

Finally, a number of Course Leaders drew attention to their belief that, although collaborative course design and team work is more difficult, it is becoming an essential requirement in complex multi-media learning environments, especially when course designers are not co-located.

It is interesting to compare these conclusions with those of Sugar et al (2004). Although working in a different context, they found that, among school teachers, "technology adoption is a personal decision, uninfluenced by other people and the presence of resources or impediments in the local school/district" (p 211). They also speculated that these personal decisions "may reflect the isolated nature of the teaching context, a situation in which supportive people, resources, and in-classroom training are lacking and thus viewed as inconsequential to the technology adoption decision." (p 211) If students are to be encouraged to be self-directed, the course design should address their needs, not those of the teacher/course designers. Beginning by designing the learning outcomes of a course to integrate with a flexible array of learning resources and a sympathetic use of communications media, is one way of encouraging a learner-driven pedagogy.

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The Design of Distributed Learning in UHI Questionnaire

Course Designer Attitudes towards Distributed Learning

The following ten questions are designed to survey attitudes towards Distributed Learning in UHI. We consider 'distributed learning' to mean that the learners are geographically distributed AND that a range of learning resources are used. We have designed this form to be filled out by course designers who have learners that are geographically scattered - please forward to someone else in your institution if you do not design courses or modules in this category.

1. What forms of communication does your course utilise for interaction between tutor/teache learners?

	Mainly	A Lot	Some	Not a Lot
Face-to-face				
Distance-based print materials				
Email				
Video conference				
Audio conference				
Virtual Learning Environment (VLE)				
Online discussion board				
Instant messaging				
Skype audio				
Skype video or Netmeeting				
Residential attendance				
CD or DVD				
Other				

2. When designing a new distributed course, would you agree with the following statements?

	Agree Strongly	Agree	Agree partially	Disagree
I start from scratch				
I start with a 'traditional' course format then adapt				
I select the method of communication with students that I am most comfortable with				
I select the types of educational technology that I am most comfortable with				
I try to match the learning outcomes to the available learning technology				

I select the most appropriate delivery style for the student then write my course around that.				

3. Before your course is taught do you

	Always	Often	Sometimes	
Give consideration to alternative forms of media for learning materials and activities?				
Assess the individual student's technology skills				
Provide an induction/training event in the technology to be used				
Give consideration as to how you will measure students technological progress				
Consider how you evaluate the success of your mix of learning resources				
Expect learners to be technologically competent to access learning resources electronically				

4. In respect of the students' ability to use educational technology which of the following stater do you agree with

	Agree Strongly	Agree	Agree Partially	Disagree
I expect students to have a basic competence in using online resources				
I expect students will require some pre-course training				
I expect to have to provide a helpdesk support for students during the course				
Competent use of educational technology gives students better access to self-directed learning				
Competent use of educational technology gives students better access to tutors than 'traditional' (face-to-face) teaching systems				

5. In your own context, for your students, what do you consider to be the optimum method of providing a good learning experience?

	Mainly	A Lot	Some	Not a Lot	
Face-to-face					
Distance-based print materials					
Email					
Video conference					
Audio conference					
Virtual Learning Environment (VLE)					
Online discussion board					
Instant messaging					
Skype audio					
Skype video or Netmeeting					
Residential attendance					
CD or DVD					
Other					

6. Why do you prefer these methods of interaction?

7. In relation to your own use of educational technology do you agree with the following statem

	Agree Strongly	Agree	Agree Partially	Disagree	
I have had specific training in using this methodology?					
I always evaluate student satisfaction with the pedagogical mix? (not just course content)					
I consider that the manner in which students learn is as important as what they learn					
My educational environment encourages diversity and experimentation in the use of different learning resources					
I consciously look for new ways of using technology to enable my students to understand better					

8. At which academic partner are you based?

- Argyll College
- Highland Theological College
- Inverness College
- Lews Castle College
- Lochaber College
- Moray College
- Ness Foundation
- North Atlantic Fisheries College
- North Highland College
- Orkney College
- Perth College
- Sabhal Mor Ostaig
- SAMS
- Shetland College
- Sustainable Development Research Centre
- Other (please specify)

9. What do you consider to be the THREE most important aspects of course design?

- Understanding who the target learners are
- Having clear learning objectives
- Assessing prerequisite knowledge of the subject
- Assessing prerequisite knowledge of ICT
- Articulating clear skills and assessments
- Identifying resources to aid your teaching
- Controlling resources available to learners
- Controlling the order of course content
- Controlling the pace of course delivery
- Accommodating variations in students learning styles
- Accommodating variations in learners' objectives
- Giving immediate feedback to learners
- Other (please specify)

10. What do you consider to be the THREE most significant limitations in current course desig facilitate a distributed delivery?
Reliability of internet technology
Ensuring the equivalence of the learning experience
Providing appropriate feedback in time
Making appropriate resources available to learners
Ensuring fairness in assessments
Providing depth in feedback
Delivery costs
Support costs
Keeping track of learners progress
Ability of learners to cope with the demands of technology
Other (please specify)