

An Exploratory Comparative Study of Distance-Learning Programmes

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Abstract

In this paper we describe an exploratory study of distance learning practice. We review five different distance learning programme models from five different schools at the University of Hertfordshire, each varying in production and presentation. We situate the programmes in an extension of Weller's pedagogy-technology space, and we further qualify their pedagogy, using Chickering and Gamson's principles as a basis for evaluation.

The results of our analysis show that while the flexibility offered to students and economics of distance learning are indeed important drivers for implementation and adoption of distance learning, the quality of teaching and students' learning experience is less well understood and frequently overshadowed by the above-mentioned factors. Moreover, we found that certain principles for 'good teaching' become more important than in the face-to-face scenarios, some principles assume different meaning in distance learning situations and new principles related to effectiveness and 'affordability' of on-line communication emerge and gain in importance.

The study aims to help develop a framework for analysis to be a tool for programme planners in a dynamic education environment. It is already helping in formulating implementation of the ambitious distance learning strategy at University of Hertfordshire but can also help other higher education institutions that aspire to provide quality distance learning education in the future as well as in informing other providers of distance learning materials and tools.

Keywords (5-10): distance learning, distance learning programmes, distance learning pedagogy distance learning models, Chickering and Gamson's principles.

1. Introduction

A simple, commonly agreed definition of distance learning is that of 'planned learning that occurs in a different place from teaching...' (Moore & Kearsley, 1996:2). This definition is broad enough to include all evolutionary stages of distance learning from early correspondence courses to the present generation based on increased use of the internet. The media used to present learning materials has changed over time and as a consequence so has communication between teacher and learner, with many more opportunities for shared and collaborative learning emerging in the modern age.

In addition to the separation of learner and teacher in space (or time), Sherry (1996) identifies two more 'hallmarks' of distance learning: control of learning by students and non-contiguous communication between student and teacher.

We argue that neither of the above characteristics is specific to distance learning, nor necessarily implied by contemporary distance learning. Active, student-controlled learning is desirable attribute of any type of learning. Also, more and more researchers and practitioners are emphasising the importance of 'pacing' of learning materials (Sherry, 1996, Galusha, 1997, Cohen, 2002) as well as of increased teacher 'presence' (Garrison, Anderson and Archer, 2000) in distance learning processes. Advancing ICT capabilities such as audio and video conferencing meant from the 1980s onwards communication no longer had to be asynchronous. More and more synchronous interactions became feasible through the use of technologies such as Skype, virtual classrooms (e.g. Elluminate) and similar. Classroom-based courses are also increasingly encompassing asynchronous means of communication between the teacher and students, through the use of e-mails, chats, discussion forums etc.

In addition to the medium used for learning materials and communication, further distinction can be made based on the unit of learning, that in the context of higher education can be a single module (or course), degree programme or an entire institution.

Through the rest of this paper we will adopt Moore & Kearsley's (1996:2) definition in the context of internet-enabled distance learning and we will consider five different distance-learning programmes offered at five different schools at University of Hertfordshire, that vary in scope, production and presentation.

The aim of the study is to help develop a framework for analysis to be a tool for distance learning programme planners. The main objective is to identify principle dimensions and attributes of distance learning programmes that can be used to compare different programmes and to contextualize them for evaluation purposes. Another objective is to assess applicability of some of the course (module) – based evaluation tools, such as Chickering and Gamson's (1987) principles, in the context of distance learning programmes.

The approach used in the paper is based on semi-structured interviews with programme tutors and teachers from the five programmes. Programmes were selected based on their match with the definition of distance learning adopted in this paper, and do not include some other approaches regarded as distance learning by the University administration, such as 'dissertation top-up' programmes, 'fly-in faculty' programmes, or 'work-based learning' programmes.

Pre-prepared interview questions, included basic programme descriptors, such as number of students, type of assessment, etc., as well as specific questions on the extent of implementation of specific Chickering and Gamson's (1976) principles in teaching and programme implementation. Those questions were augmented with additional questions that came out as a result of the interviewees' responses. These additional responses were 'normalized' and sorted into additional categories, such as, drivers and barriers for staff engagement, effectiveness of distance learning and measures of it, degree of interaction between classroom based (CB) and distance learning (DL) students etc.

The paper is organized as follows. We start with a review of the literature in section 2. This is followed by a summary of cases (section 3), comparison of cases and relevant discussion (section 4) and conclusions (section 5).

2. Background

The literature review on distance learning (or distance education, as it is sometimes referred to) reveals a large body of work on issues, barriers, benefits and strategies for implementation. Equally, it reveals a lack of standards for classifying different modalities of distance learning.

Dillenbourg (1999) argues that collaborative learning cannot be discussed unless the learning is contextualized: similarly, within distance learning the 'space' must be defined. In other words, an object in 'distance learning space' defines one type of distance learning with specific effects that cannot be automatically generalized to other objects in the space. For example, the effects of distance learning taking place with a small group of part-time local students with a residential tutoring option cannot be extrapolated to distance learning taking place with a massive 100+ globally distributed cohort. Therefore it is important to understand different defining characteristic ('dimensions') of distance learning approaches, in order to contextualize results.

Bélanger and Jordan (2000) provide an overview of the learning variables applicable to distance learning that includes learning objectives from Bloom's (1956) cognitive, psycho-motor and affective domains, interactivity (between learners, and between content and learner), content navigation and search capabilities of the learning materials, and synchronicity of communication.

Weller's (2002) framework for classifying distance-learning courses extends Bélanger and Jordan's (2000) set of pedagogical variables with technology-related attributes. This approach is based on the premise that technology and pedagogy are 'intertwined' in any online course, i.e. actively and iteratively influencing each other. The framework has two dimensions representing the influence of technology or pedagogy on the course.

The 'technology' axis represents the degree of technological sophistication in the design and delivery of a course. Weller (2002) proposes the following criteria for assessing the technology of a course:

- Range of media (audio, video, animation)
- Interactive tools such as quizzes, games, simulations
- Degree of personalization offered
- Sophisticated back-end (tracking progress, logs, annotations)
- Web-page design including navigation, interactivity, search
- Web 2.0 tools (wikis, blogs, RSS, sharing of slides, images etc.)
- Communication environment to facilitate dialogue e.g. discussion forums, chats, etc.

Additionally, the following more recent net-centric applications (Anderson, 2009) should be added to the criteria for technical 'richness' of a course:

- Awareness mechanisms, such as notifications (e.g. RSS), online presence and status updates (e.g. Twitter) etc.
- Tools for supporting virtual communities, based on the 'wisdom of the crowd' idea such as wikis, Digg, Facebook, wePapers, Course Hero, Elgg, Ning, VoiceThread.com etc.
- Emerging network-centric applications for aggregating the information and extracting knowledge (e.g. Slashdot, Omgili)
- Mobile learning
- Virtual worlds such as Second Life etc.

Two different poles of the 'pedagogy' axis represent a 'didactic' or teacher-directed approach, and a 'constructivist' or student-centred, collaborative approach. Rather than considering learning objectives, Weller uses following criteria for characterising how close is the pedagogy of the course to either the didactic or constructivist end of the scale:

- Focus on content vs. focus on students' interaction
- Assessing retention of content vs. assessing student's interpretation
- Traditional lecture-based teaching vs. 'conversational' teaching and active learning
- Teacher as an expert vs. teacher as a facilitator or mentor
- Learning as a knowledge acquisition vs. learning as a construction of knowledge through social activity.

The extent to which the above attributes prevail in the course, will determine its proximity to either side of the pedagogy axis.

The two-dimensional framework results in four different categories of distance learning:

- Low technology/didactic approach, based around streaming video lectures, and some form of CMC (computer mediated communication) such as email, suitable for initial adoption and low investment
- Low technology/constructivist approach, includes simple websites with more substantial CMC capabilities; suitable for small scale university courses in non-technical subjects that involve discussions and debating e.g. online courses in theology, philosophy, history and similar
- High technology/didactic approach, also know as 'web-based training', often aimed at individuals, who may or may not be supported by a tutor; suitable for CPD, professional certifications, accreditations, life-long learning and work-based learning
- High technology/constructivist approach, encompasses virtual environments, different online spaces that promote collaboration; particularly useful for engineering and scientific subjects.

Weller (2002) adds that the total cost, including production of materials (production cost) and staff time for course delivery (presentation cost) differs significantly between the four models, with the lowest cost being associated with low technology/didactic approach and highest with the high technology/constructivist approach. He concludes that balancing the trade-off between the cost and technological and pedagogical sophistication of the course is the key factor for success of online courses.

One interesting observation with cost implications noted by Lozier, Oblinger, and Choa (2002) is that centralized services are generally used to support development and technology solutions while responsibility for core academic decisions, including course content, conferring degrees and faculty workload remains within individual departments.

Similarly to Weller (2002), Cohen (2002) proposes a model for evaluation of distance learning courses, based on the combination of pedagogical and technological factors. He further distinguishes between different pedagogical criteria, such as: the process of learning and teaching, the community of learners, the role of teacher, the role of students and implementation of the course.

Gaspray, Dardan and Legorreta (2008) consider the effectiveness of distance learning through the 'lens' of different learning theories, such as objectivist, constructivist, collaborative, socio-cultural, cognitive and computational models of learning. They suggest that each of the learning models, implies different meaning of learning 'effectiveness' i.e. student grades, student satisfaction, perceived interaction difficulty, perceived flexibility, learning climate, perceived knowledge and skill development respectively. They conclude that distance learning has characteristics that are important to all learning models, and while, the first three models are well-understood and widely accepted by practitioners, the last three need more attention, in order to 'enable minority perspectives (socio-cultural model) as well as individualized perspectives (cognitive and computational models)' (Gaspray, Dardan and Legorreta, 2008:58).

This suggests that constructivism in Weller's framework should be placed somewhere in the middle of pedagogy axis, while the pole opposite the 'didactic' end of the scale should in fact be characterized as socio-cultural, cognitive and computational.

Sherry (1996) identifies two main models of distance education, based on the starting point or 'philosophy' of the design. The 'Iowa model' starting point in design is classroom-based teaching, and here distance learning tries to recreate this classroom environment via mediating technologies such as virtual classrooms, audio-visual interactions etc. Alternatively, the 'Norwegian model' starts with distance teaching that can be computer-mediated and combined with some local 'face-to-face' support. A third model, not mentioned by Sherry, is based on the Iowa model but in addition provides local face-to-face support in a form of residential sessions or local tutoring (branded as 'tutored e-learning' by University of Hertfordshire - <http://www.herts.ac.uk/courses/schools-of-study/computer-science/online-courses/supported-elearning.cfm>).

Beldarrain (2006) explores the affordances of different new technologies, such as wikis, blogs podcasts etc. in the context of distance learning, and suggests the use of Chickering and Gamson's (1987) principles as a starting point for defining the purpose and rationale of integrating specific technology into the distance learning curriculum.

Chickering and Gamson's principles were published in 1987 in a bulletin of the American Association for Higher Education & Accreditation, as a direct response to a call made by the association for easy to understand, practical and general principles that would guide further reforms of higher education and lead to better student experience. The principles state that good practice in undergraduate education:

1. Encourages contact between students and faculty
2. Develops reciprocity and cooperation among students
3. Encourages active learning
4. Gives prompt feedback
5. Emphasizes time on task
6. Communicates high expectations
7. Respects diverse talents and ways of learning.

Our choice of the principles as a framework for comparison was based not only on their simplicity and practicality, but more importantly because they were founded on more than 30 years of research on how we teach and how students learn.

Research findings especially support the principle of staff contact with students, active learning and delivery of feedback, all three of which are said to have a positive impact on students' learning and engagement. Critiques of the principles argue that their importance varies across different disciplines, teaching methods, learning styles or organisations (e.g. Sorcinelli, 1991). For example, they are better suited for humanities and social sciences and are intended for traditional (18-21 year-old) students. Dalton & Tharp (2002) argue that the principles are incomplete and suggest additional constructivist-based requirements such as that teacher and students should join in productive activities and that

'meaning' should be generated by linking the curriculum to students' lives.

Despite all the issues, the principles have survived the test of time, and remain a popular tool for guiding curriculum design (Beldarrain, 2006) and evaluating the quality of learning and teaching in online courses (Graham et al., 2001).

As observed by Merisotis and Phipps (1999) the research literature is focused on modules (or courses) and lacks in evaluation of distance learning programmes. In this paper we start to address that question.

We use Weller's framework as a basis for classification of distance learning programmes and we extend it with some other categories that appeared in course of discussions with the interviewees. Once the programmes are 'situated' in this 'extended' Weller's space (Figure 2), we further qualify their pedagogy, using Chickering and Gamson's principles as a basis for evaluation and comparison (section 4).

3. Summary of cases

In this section we summarize (anonymously) details of five programmes from five different subject areas, based on data collected in December 2009, excluding any subsequent programme changes.

Case 3.1

This MA programme was established in 2007/8 and initially targeted international students though it also includes a few home students. It is relatively small (less than 20 students). The learning and teaching model of the programme (including assessment) is based on a similar classroom-based programme (Iowa model) and employs a range of technologies such as (proprietary) MLE, Flickr (for uploading students' work), discussion forum, email, Skype and Facebook for discussions and feedback, as well as recorded guest lectures. Teaching is done via guest lectures and students are supported in developing projects through frequent interaction with a tutor. Learning effectiveness measures are not decisive due to the small size of the cohort. The entire programme is supported by one (enthusiastic) member of staff! The main barriers for further staff engagement are the fear of extended workload, inadequacy of the current workload model for distance learning provision as well as a doubt among staff members that distance learning is an adequate method for learning creative subjects. In terms of Weller's (2002) classification, the model can be described as low technology/constructivist approach, with low production cost (as there are no teaching materials specifically developed for the programme) and high presentation cost, due to the intensity and frequency of interactions between the students and staff.

Case 3.2

This BSc programme was established in 2004, and since then more than 1,200 students have enrolled and more than 600 have graduated. The programme runs in two different modalities: online (Iowa model) and online with local (face-to-face) tutoring support ('tutored e-learning'). The student population is derived from over 35 countries across the world.

Online students are tutored by UH staff predominantly through the University's MLE (purpose-built learning materials, discussion forums, blogs, wikis, group work, electronic journals, e-books). The use of the MLE is supplemented by a suite of applications to support synchronous collaborative work, presentations, vivas and online tests. Tutored e-learning students have access to the same online facilities and resources but also receive local tutor support from staff at a partner institution.

Independent study is supported through sequenced learning activities. The programme's pedagogical framework (Pyper, Lilley & Hewitt, 2009) is based on learning activities comprised of tasks and resources and a narrative component to provide rationale for the work.

Although there is no formal interaction between classroom-based and distance learners, some online learning materials are currently being used by classroom-based modules, enhancing the flexibility for these learners. Learning effectiveness is high compared to similar classroom-based programmes, with distance learners achieving slightly better grades and expressing higher level of satisfaction with the course. The retention rate is comparable to similar classroom-based programmes. Drivers and barriers for staff engagement are related to individual preferences i.e. some staff prefer face-to-face teaching, others prefer the flexibility offered by distance learning.

Both modalities can be classified as medium to high on the technology scale, and in the 'middle' on the (constructivist) pedagogy scale. The production and presentation cost will also be somewhere in the middle, with the strong economy of scale effect, as the programme continues to grow.

Case 3.3

This postgraduate programme offers a flexible route, where students can choose the duration (12/15/18 months) and mode of study (classroom-based or distance learning). The student population consists of more than 70 early career professionals. It is designed as a combination of classroom-based teaching (induction weekend and another extended weekend) with online activities. All technologies used are based on the (proprietary) MLE extended with additional features for online delivery, designed by a dedicated member of staff. Pedagogy is content-driven with some elements of experiential learning (activities) and collaborative learning (discussions).

Case 3.4

The postgraduate programme is aimed at working practitioners who need to complete specific professional training. It was established in 1996, with currently more than 150 students enrolled of whom 50% are home with the rest mainly from EU. It is designed as a combination of distance learning (14 weeks) and residential 3-day workshop/conference after the first six weeks. It can be classified as the 'Norwegian' model. Apart from residential sessions which are based on tutor-led problem-based and collaborative learning activities, tutor support is limited to on-demand contact and extra support for weaker students. Technologies used are limited to (proprietary) MLE and telephone communication. Although the learning effectiveness data are not provided, students are highly motivated as they are expected to report back at their workplace. The majority of teaching staff are visiting lecturers i.e. working practitioners from industry.

Case 3.5

This postgraduate programme is aimed at students who wish to convert a first degree into a professional qualification. The distance-learning route runs in tandem with the classroom-based and was established in 2007. It is relatively small with around 60 students enrolled about one third of whom are distance learners based mainly in the UK. It follows the Iowa model: lectures and plenary sessions are recorded in the classroom and uploaded on the (proprietary) MLE. Initially pedagogy was didactic, but a staff project established in 2010 was set to move closer to the constructivist end of the scale. Technologies used include (proprietary) MLE, audio podcast, virtual classroom (rarely), discussion forums, and email. Achievement and retention for distance-learning students is comparable to that of classroom-based peers. Student satisfaction is hard to administer, but comments are usually highly positive. All students are enrolled on the same programme and have access to all materials.

4. Comparison of cases

We start to differentiate between the five programmes (Figure 1) using the following attributes for comparison:

1. Level of study
2. Student population
3. Years running to-date
4. Scale (number of students)
5. Learning and teaching model (Iowa, Norwegian, face-to-face%)
6. Technologies used
7. Leading pedagogy i.e. the pedagogical approach used by the majority of modules in the programme
8. Learning effectiveness (measured through students' performance, satisfaction and retention rate)
9. Interactions between classroom-based (CB) and distance learning (DL) students
10. Drivers and barriers for engaging teaching staff
11. Staff profile i.e. permanent (CB), visiting lecturers, specially employed staff etc.

While the first four attributes correspond to simple 'demographic' aspects of a programme, others result either from the reviewed literature (5-7) or emerge as important aspects of DL programmes in discussions with the interviewees. An additional criterion for differentiation is the subject discipline, which is not considered in this paper because of anonymised data.

Case	Scale/Student population	Basic model	Face-to-face %	Technology	Pedagogy	Staff	Learning effectiveness
3.1	Low/ UK + some O/S	lowa	0	Low	Constructivist	Dedicated to DL programme	NA
3.2	Very high/ 35 different countries	lowa	0/50%	Medium - high	Middle between didactic/constructivist	Combination of CB staff, tutors at partner institutions and visiting lecturers.	Better results and higher satisfaction than CB students
3.3	Low-medium/ UK	lowa	Induction day + 3 days	Low	Didactic	Same as for CB students	NA
3.4	Medium/ UK+ some EU	Norwegian	3 days per module	Very low	Middle between didactic/constructivist	Mainly visiting lecturers	Highly motivated students
3.5	Medium/ mainly UK	lowa	0	Low	Didactic	Same as for CB students	Comparable results; CB students switching to DL mode

Figure 1 Comparison of distance learning programmes

While the programmes clearly differ in scope, use of technology and pedagogy, they each offer specific value to a specific, target population of learners: continuous conversation guiding development of student's practice (3.1), focus on self-study for professional qualifications (3.3 and 3.4), support for large diverse cohort of international students (3.2) and integrating distance learners with CB students into a more cohesive learning community (3.5).

By comparing and contrasting the pedagogy and technology of programmes under investigation, we are able to situate each programme in Weller's distance learning space (Figure 2), extended with new dimensions such as subject discipline, scope (number of students) and Sherry's (1996) distance learning categories, represented by shapes of different size in Figure 2.

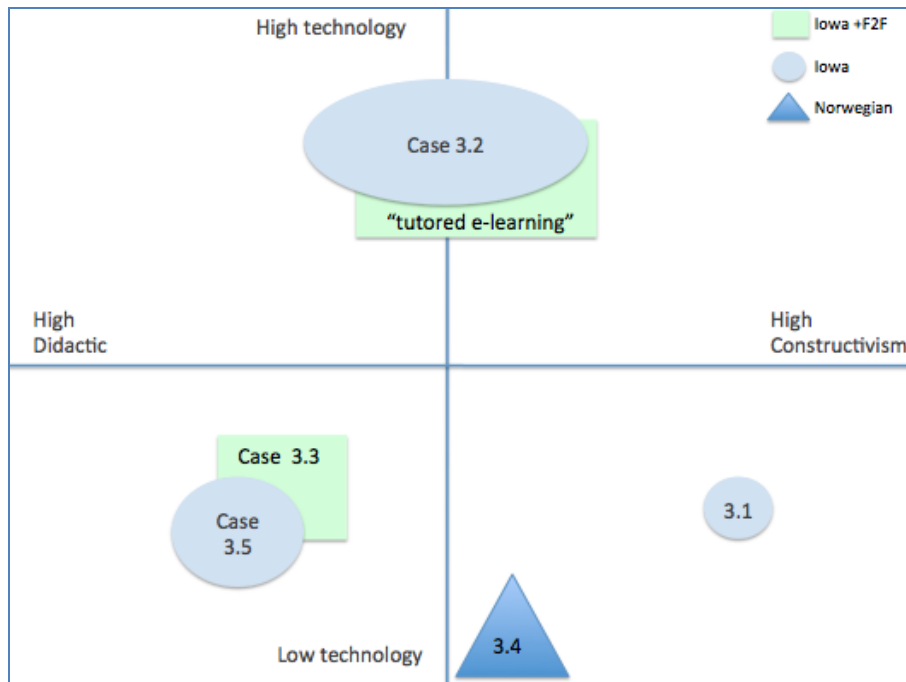


Figure 2 Distance Learning Programmes Space

In the rest of this section, we continue to differentiate between programmes' pedagogies using Chickering and Gamson's (1987) principles as a framework for discussion. To refer to a specific case, we use the corresponding section number i.e. 3.1, 3.2 etc.

4.1. Good practice encourages contact between students and faculty

Examples supporting this principle include: daily staff availability via emails (all cases), Facebook chat (3.1), tutor's feedback on Flickr uploads (3.1), tutor engagement in discussion forum (3.3), personal tutoring via e-mail, phone or chat (3.3), and use of Skype/Elluminate/Facebook/individual online work areas (3.2).

In case 3.4, a three-day residential session is setup as a conference, providing formal and informal interactions. As learners are adults, there are fewer barriers between students and teachers.

Additional social activities are organised in case 3.5, where locally-based DL students are invited to public formal and social events with staff.

4.2. Good practice develops reciprocity and cooperation among students

This principle is supported with mechanisms for awareness ('see who is online'), use of (online) discussion forums (3.1), discussion group 'meeting rooms' (3.2) etc.

In case 3.3, students are encouraged to post on discussion boards, with some less frequent use of wikis and blogs.

Residential workshops offer opportunities for collaboration and cooperation – some assessment in case 3.4 is a group-based workshop: students are purposely not introduced, encouraging them to find out about their colleagues.

In case 3.5, students are asked to post an online biography to create a sense of community. Group formative assessments require collaborative activities between CB and DL students.

Although the literature emphasises the importance of the social component of distance learning (Garrison, Anderson, & Archer, 2000), it can be difficult to achieve (at least synchronously) in cases where the majority of students on programme do not share same time zone (3.2).

4.3. Good practice encourages active learning

In case 3.1, the tutor indicates various (online) information sources required for a live project.

In case 3.2 this is facilitated through a pedagogical framework (Pyper, Lilley & Hewitt, 2009) that guides tutors in designing various online tasks to keep students active.

Case 3.4 is based on extensive self-directed study periods before and after the residential session.

In case 3.5, online quizzes offer structured feedback and encourage cooperation between learners, discussing particular questions or answer rationale etc

4.4. Good practice gives prompt feedback

Examples include: feedback on Flickr images (3.1), annotated essays or sample answers after the residential session in case 3.4, response to email enquiries and use of audio for feedback i.e. recorded comments in case 3.5.

In case 3.2, a 'service level agreement' is established regarding the expectations of staff and students' engagement with discussion forums and emails. In addition to that, automated tools, annotations and sample answers are used to provide feedback.

4.5. Good practice emphasizes time on task

This principle was not considered in cases 3.1 and 3.4, where students are expected to conduct self-directed study, supported by subject tutors, (when requested). In case 3.5, module guides specify session outlines, including formative activities planned for the session. More granular time on task is implemented in cases 3.2 and 3.3, where students are asked to complete weekly individual or group tasks with deadlines, using variety of methods and technologies (proprietary MLE groupware, Facebook etc). In addition, in case 3.3 all units are broken into timed tasks.

4.6. Good practice communicates high expectations

According to most interviewees, the implementation of this principle relies on the type of learning activities used in different modules. For example, in case 3.1, students are expected to work on a 'live project' and to publish the results of their work (as well as work in progress) on a public website.

4.7. Good practice respects diverse talents and ways of learning

With regards to this principle, various programmes offer various approaches. In case 3.1, programme tutor acts as a personal tutor, and provides one-to-one support to individual students. Students are accepted based on the portfolio and set of learning objectives that they want to achieve. The programme does not provide teaching of techniques but instead aims to support students in developing individual practice.

In case of 3.2, from its inception, the programme was designed to support diversity and flexibility, by offering two modalities of distance learning (with or without face-to-face contact).

In case 3.3, students are offered flexibility not only in where and how they learn, but also in the duration of their studies (12/15/18 months). In case 3.5 students can choose to study wholly or partly by distance over one or two years.

In cases 3.2 and 3.4 assessment variety helps support different types of learners.

4.8. Discussion

The principles used for comparison are useful in situating the pedagogy of different DL models, however they seem to mean different things to different people. These differences seem to have been even greater across programmes.

Weller (2002), Chickering and Gamson (1987), and indeed most evaluation studies, concentrate on specific courses (e.g. Graham, 2001; Buckley, 2003) or usability of technological solutions (e.g. Tselios et al, 2001). This, perhaps inevitably, means that the usefulness and applicability of some of the principles varies when extrapolated for DL programme analysis.

Based on the data from our study, it may be anticipated that some principles are usable at programme level (e.g. 4.1, 4.4 and 4.7) while others are perhaps expected to be more module/teacher-centric (4.3, 4.5, 4.6) or cohort-dependent (4.2).

Amongst the 'programme-level principles', principle 4.1 ('staff-student contact time') and 4.4 ('prompt feedback') could be formulated within the programme service level agreement, while 4.7 may be answered by the intrinsic flexibility of distance education.

Although Weller's framework was intended for classifying online modules, it can be applied equally well in the context of distance learning programmes, as they tend to exhibit higher 'cohesion' with respect to pedagogies and technologies used across different comprising modules (Lozier, Oblinger, and Choa, 2002). Indeed the experience in case 3.5 is that this consistency is not just a feature but a requirement for student satisfaction in a DL model at the didactic end of the spectrum.

5. Conclusions

Comparing distance learning programmes is clearly non-trivial; for example, different pedagogies imply different meanings for learning effectiveness, as suggested by Gaspray, Dardan and Legorreta (2008). There are also issues with gathering and interpreting appropriate primary data, which our own experience highlights; the design of different research instruments – for example, a questionnaire to be consistently administered across programmes – could be considered.

It is very difficult to draw definitive conclusions from the current data analysis under Chickering and Gamson (1987), although it has been possible to identify which of their principles are useful at programme level. It is easy to see the value of an overarching framework for evaluation not least at the design and implementation stage of programmes. Such a framework could provide a mix of quantitative and qualitative data to support stronger conclusions in the future.

So, the value of this work is in sketching such a framework for analysis to be a tool for programme planners in a dynamic education environment. In particular, one of its key strengths is the combination of technological and pedagogical axes – the literature indicates that historically there has been an over-emphasis on technology and this framework offers an integrated way to move forward. This framework, including accessibly-formulated principles also offers a chance for programme planners to expound a practical pedagogic rationale to staff who may well be, as many have noted, reluctant to reflect on their own teaching practice.

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