The promise of Online Distance Learning: Addressing academic and institutional concerns

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Abstract

The increasing capabilities and availability of information and communication technologies now make it technically feasible for education to be pursued via Online Distance Learning (ODL). This is currently a new domain and is perceived by some to offer significant promise, whilst others regard it as a threat. This paper proceeds from the initial assertion that ODL is a beneficial concept, which will have a significant role in the future provision of learning and training. It then proceeds to highlight a number of problems (considered from academic and institutional viewpoints) that could potentially be faced if establishments do not devote sufficient thought to their realisation of the approach. The discussion is based upon observations from the authors' own experiences when attempting to introduce ODL facilities in practice, and the opinions received during consultation with academic staff. The authors are all believers in the ODL concept, but have been exposed to various negative viewpoints that must be addressed to ensure the successful and widescale adoption of the concept. A series of recommendations are presented to assist institutions considering an ODL approach.

Keywords: Online Distance Learning, Academic concerns, Institutional concerns.

1 Introduction

The last two decades have witnessed significant use of information technology within the educational context. Computer systems have not only been utilised to support administrative and operational activities, but also to directly contribute to the learning process. Example technologies in this respect include Computer Aided Learning (CAL) and Computer-Based Training (CBT) (Alessi and Trollip 1991; Lee and Mamone 1995). However, to date, information technology has generally been used to supplement traditional methods of delivery. As we enter the new millennium, advances in communications technologies and multimedia capabilities, in conjunction with the mainstream acceptance of the Internet and World Wide Web (WWW), are now acting as the catalysts for the next level of IT utilisation, which this paper refers to as Online Distance Learning (ODL). At a basic level, ODL refers to the ability

to deliver and participate in educational or training programmes on a remote basis, using information and communication technologies to overcome the barrier of distance.

ODL represents an approach that can be employed by a variety of establishments (e.g. universities and colleges, training agencies or departments within companies). The paper refers to these by the generic term Learning Resource Providers (LRPs). However, several aspects of the discussion are presented from a university perspective, as this is the environment from which the authors' experience is derived. The participants in an ODL-based programme could be students registered with a university-type institution or clients of a commercial training programme. The paper will use the term 'participants' to encompass these and other similar possibilities.

The WWW (Berners-Lee et al. 1994) is considered to provide a particularly suitable platform for ODL delivery, enabling the integration of a number of appropriate technologies (ranging from simple text and graphics to audio and video presentations), learning methods (e.g. discussion, formative assessment) and administrative aspects (e.g. tracking and logging). Furthermore, it offers the capability for interactivity between the LRP and remote participants. Within this environment it is, therefore, possible to support a range of learning and training scenarios, from the provision of reference materials to more interactive elements, such as lectures and simulations. These capabilities are likely to advance still further as WWW technologies and access facilities mature. As such, ODL can be seen to offer significant promise for the future. However, whilst ODL can be claimed to offer a number of significant opportunities, there are also a range of issues that may be cited as potential criticisms. A number of these points arise from the fact that it is still an emerging field and there are uncertainties over both the degree to which the benefits may be realised in practice, as well as the potential negative factors that may also be introduced as a consequence. This paper seeks to explore these issues and the main discussion begins by summarising the benefits offered to both LRPs and their participants. The focus then proceeds to consider the various problems that could arise, from the perspectives of both academic quality and administration within the LRP. The discussion of these issues leads to recommendations that should be considered by LRPs wishing to offer online courses.

Many of the views identified in the paper have been determined as a result of the authors' practical involvement in ODL initiatives. These have included contributions to the development of an institutional strategy for electronic delivery, which involved consultation with academic staff and provided insights into their concerns, as well as giving an indication of the issues to be faced at an institutional level. In addition, the authors have been involved in a practical project to enable the online delivery of MSc modules and industrial short course programmes. The feasibility stage of this work offered another opportunity to gather opinions about the ODL concept. This was achieved via paper-based questionnaires (which were sent to academic staff within the authors' establishment and to 100 external companies) and subsequent face-to-face discussions with selected representatives. The results were used to gauge the expectations and requirements of both parties in relation to ODL delivery (Furnell et al. 1999). The practical

element of this project involved the design and development of software tools to support ODL delivery (Furnell et al. 2000). A Module Authoring Tool has been produced to provide the creators of online modules with a simplified and customised application in which to create WWW content. In addition, an Online Lecture framework has been devised to enable the delivery of interactive lectures (encompassing video, audio, slideshow and whiteboard elements) from a central location to remote participants over the Internet. The development of these aspects, and the feedback from potential end-users, has again provided relevant insights into the acceptance of the ODL approach. In view of these experiences, the authors are well-placed to comment on the ODL debate.

2 Benefits of Online Distance Learning

There are undoubtedly benefits to be gained from a carefully considered implementation of ODL, which can be cited from both the LRP and participant perspectives. For the LRP, the possible advantages include:

- increased potential market for programmes, with a potentially global catchment area;
- potential for collaboration with other establishments to create high-quality 'virtual' programmes, drawing upon expertise from different sources;
- reduced operating costs in terms of capital assets (e.g. buildings and equipment). This, of course, only applies to those organisations wishing to offer solely ODL delivery.

At the same time, the benefits for the participants include:

- access to expertise irrespective of distance;
- on-demand learning, suiting the schedule of the participant rather than the timetable of the LRP (depending upon implementation);
- delivery and presentation can be tailored to suit the existing knowledge or skills of the individual learner (i.e. personalisation of content) using a common core of materials (Mengel 1998).

For persons wishing to pursue education on a part-time basis (e.g. in conjunction with their employment), ODL represents an attractive option, whereas face-to-face delivery can cause inconvenience to both participants and their employers. For example, organisations may frequently send their staff on accredited programmes at academic institutions such as universities or colleges. Such training may take place on either a ‘day release’ basis or as a short course over an intensive period spanning several days. Whilst these approaches are generally successful in delivering the expected training, a number of problems can be identified from a practical point of view:

- the need to physically travel to the training institution (frequently over a significant distance, increasing inconvenience and lost time);

- the requirement to attend at a preset time (irrespective of other work requirements or pressures);
- difficulties in establishing a suitable common baseline level of knowledge from which to proceed for all participants.

In some cases, relevant expertise may not be available at any training institution within a reasonable distance. In view of these observations, the facility for on-demand distance learning would be considered extremely advantageous. In this context, ODL can also be seen as a valid contribution to initiatives such as lifelong learning (DFEE 1998).

The above points are widely cited as reasons why ODL may revolutionise the provision of education (Cochrane 1995) and a variety of establishments have begun to offer online programmes (TeleEducation 1999). However, whilst there are many advocates of ODL, there are also a significant number of detractors. The authors' experience suggests that many academic staff at the grassroots level would regard the potential benefits as utopian claims and unlikely to hold true in practice. The concerns that can be levelled at the ODL concept can be considered from both the academic and institutional perspectives. These issues are considered in the sections that follow, along with appropriate discussion and recommendations.

3 Academic concerns

From an academic perspective, the concerns are related to the quality of the educational experience that can be delivered via ODL in comparison to traditional face-to-face methods. Many of these points are particularly related to the perspective of the academic staff responsible for providing the courses, and the authors have encountered the opinions presented during their consultations with staff as part of the feasibility study into online MSc / short course programmes (Furnell et al. 1999). The main objective of this consultation exercise was to assess the degree to which academic staff felt that their existing modules could be converted to online delivery. A total of eleven modules were assessed, each taken from M.Sc. / Pg.D. programmes currently offered by the University of Plymouth (specifically, the 'Integrated Services & Intelligent Networks Engineering' and 'Communications Engineering & Signal Processing' programmes), with several modules being shared between both courses. The respondents were the lecturers responsible for the delivery of the modules – each of whom were academics with many years' experience of traditional face-to-face delivery. The assessment considered a number of factors, including the type of information presented in the module, the presentation style (e.g. the lecturer's current delivery methods, such as slides, whiteboarding and handouts), the availability of additional background material from other sources and the requirements for practical work. The principal questions were therefore focused around these issues in the context of each specific module. However, the survey also gave scope for the academics to express any concerns – recognising that they must be both *willing* to create the content in a format appropriate to online delivery and feel *able* to create effective material. The points identified were then explored in more detail during face-to-face

discussions. The issues that emerged are described below, followed by some further observations arising from the authors' general experiences outside the specific survey exercise.

3.1 Concerns expressed by academic staff

One of the main concerns that the authors have encountered is that, if a course is to be delivered completely via ODL methods, then the educational experience may be diluted to fit the ODL model. This could encompass the removal of face-to-face activities that do not suit the distance model (e.g. hands-on tutorials, practical experiments), to the point where the associated learning objectives can no longer be fulfilled. This is certainly true to an extent and, until technology enables a better reproduction of physical participation (e.g. via advanced virtual reality systems), there may be a necessity to restrict ODL-based courses to topics whose delivery is not compromised by these limitations. Alternatively, a different type of qualification could be offered, to reflect the difference between ODL and face-to-face study in the subject area. Either of these options would be preferable to LRPs offering ODL courses whose learning experiences do not match participant or employer expectations. It should also be remembered that some establishments have successfully operated distance-based education programmes for many years. In this sense, the question becomes whether the online medium has any detrimental effect upon learning outcomes. Previous research has been conducted to suggest that this is not the case (Carswell 1997).

In general, it should be recognised that many establishments considering ODL are not traditional distance learning providers. As such, staff may have little or no experience of such delivery and will be legitimately concerned about how it will affect and/or integrate with their existing practices. For example, the survey revealed a number of concerns about the effect that ODL would have upon academic workloads. At the outset, this relates to the time required to design and create online modules, and staff expressed concern about undertaking this in addition to existing duties. The remedy for this is for appropriate allowances to be made from an institutional planning perspective (as identified in the 'institutional concerns' section that follows). Another concern is that if participants are given the flexibility to be working in a self-paced, on-demand manner, then there will potentially be a large number of participants all following the same course or module, but working at different stages of it. It was felt that, in a worst case scenario, this could result in an almost continual stream of questions, assessment submissions etc., with the lecturer being kept permanently occupied and having to switch attention between different modules. By contrast, traditional delivery is more manageable as participants all work to the same schedule (determined by the lecturer), allowing the lecturer's time to be managed more effectively (e.g. avoiding clashes between assessment deadlines). However, the need to repeatedly provide answers to similar questions from different participants can be avoided by providing an online Frequently Asked Questions (FAQ) archive. This is the approach taken within the Module Authoring Tool that the authors have developed, which enables the creation and management of such a facility (Furnell et al. 2000). It could be argued that providing the questions up-front prevents the participants from having to go through the effort of determining for themselves what the appropriate questions are. In this sense, it may be better to continue to

let the participants ask the questions, but then refer them to pre-prepared answers as far as possible. It is suggested that the problem of continuous submission of work can be avoided by having a number of fixed deadlines during the year and requiring that participants only submit during these periods. This makes things more manageable for lecturers, whilst still affording more flexibility to remote participants than a single deadline. To summarise, many of these issues can be overcome by applying the same organisational and administrative procedures that are already used in traditional delivery. However, care must be taken not to lose the benefits and flexibility of ODL.

A concern that was particularly identified amongst less IT literate staff is that ODL could be used as a vehicle to displace the role of the lecturer. The fear is that once all of the relevant course information has been made available in an online format, it could be delivered without further intervention from the lecturer. Whilst this could be seen by some as beneficial (e.g. freeing the lecturer's time for other activities, such as research), others perceive it as a threat to job security. The embodiment of the lecturer's expertise within an ODL module could lead to a situation where their services are no longer required, or the demand significantly reduced (Noble 1998). In the longer term, this would be rather short sighted on the part of the LRP, as many aspects for which the lecturer is required will not change, for example:

- the role of learning facilitator requires contextualised understanding and subject expertise;
- remote participants will still have questions that need answering;
- work still needs to be assessed (which, for anything of substance, could not easily be done automatically or by a non-expert);
- for most subject areas, materials will require ongoing update and enhancement to maintain their relevance and competitiveness.

It is the authors' opinion that, with the advent of ODL, lecturers will simply be using their time differently (and, in most cases, they would still be involved with ongoing face-to-face delivery for much of their time anyway). In cases where LRPs still adopt the view that they can dispense with staff, academics could take encouragement from the observation that, in a virtual market, they (as subject experts) are no longer geographically constrained to providing their services to a single LRP, and could well find wider employment in the ODL domain.

In the university context, another concern encountered as part of the authors' investigations has been that the ODL option may result in significantly fewer students actually attending university to study in the traditional sense. At its extreme, the knock-on effect of this would be downsizing of the physical establishment and, again, the risk of consequent job losses. However, it is the view of the authors that this would be unlikely to happen in reality, as the perceived benefits of ODL do not apply equally for all participants. Many full-time students enjoy the opportunities for social activity and other personal development that are offered beyond the pure study elements of their courses and, as such, ODL may not be seen as an attractive substitute.

Academics consulted in the study also expressed concern that ODL delivery could compromise the intellectual property rights (IPR) associated with their materials. Problems were perceived from two perspectives. Firstly, if the material is made available via an institutional server, then the lecturer has less direct control over its dissemination and, as the publisher, the institution may be deemed to have the ownership of the information (Herkert and Loui 1999). This differs from the current situation where the lecturer may still hold the IPR over the course notes and, as such, an institutional policy may be required to clarify the issue. Secondly, the online availability of materials to a potentially world-wide audience runs the risk that they may be stolen and reused elsewhere. This issue is related to that of the security of the ODL framework, which is discussed later under institutional issues.

3.2 Other academic concerns

In the initial instance, all LRPs and their staff will be inexperienced in the design and provision of ODL programmes. There is a potential problem in this respect that focus will be given to producing ODL content, at the expense of the desired learning experience. The authors' experience has shown that lecturers may place a great emphasis upon putting the appropriate course materials online, but then neglect the elements of interaction (e.g. between participants and lecturers, and between groups of participants) that help to form an appropriate learning environment. Any training programmes or guidelines for staff should recognise this potential problem and initial ODL courses should be designed with particular attention to the issue (given that initial courses are likely to act as models for those that follow).

If the above point is not addressed, then it will contribute to another concern about ODL – namely that education may become personalised, but more impersonal. Implementations may significantly reduce the human element that is provided by the lecturer in a face-to-face context. There is a risk that information will be reduced to raw facts, rather than being presented with the richness of someone's experience and enthusiasm for the topic. Participants may also lose the social experiences relating to interaction with their peers. However, there is proven evidence that strong 'social' relationships can be formed via an online medium (Poster 1990), which should help to overcome this concern. It is also argued that the reduction or removal of face-to-face elements may also make it more difficult to ensure that the participant is making appropriate progress through the learning cycle. However, it is considered that in some cases lecturers may be over-emphasising the extent to which they are able to monitor the progress of individual participants through the learning cycle in a face-to-face context (particularly with medium to large sized groups), without resorting to some form of assessment. This being the case, appropriate assessment could still be conducted via an online approach.

4 Institutional concerns

At a basic level, an LRP considering the provision of ODL faces the same questions as any organisation considering change; namely 'where are we now?', 'where do we want to be?' and 'how do we get there?'. In examining these institutional issues in the context of ODL, a number

of concerns may be highlighted, all of which indicate the need for a well-conceived strategy. The observations presented in this section are largely derived from the authors' involvement in the aforementioned institutional strategy for electronic delivery. At this level, the barriers are somewhat different to the issues perceived by individual staff members, but nonetheless require serious consideration.

4.1 Strategic issues to be considered

As yet, relatively little is available in terms of off-the-shelf ODL solutions and no system has yet emerged as an overall standard. As such, individual establishments are frequently creating in-house, bespoke solutions (the authors' experience in the creation of online tools being an example of this). This inevitably leads to variable presentation and quality between establishments and potential problems when attempting integration if establishments wish to provide joint virtual programmes (one of the conceptual advantages otherwise offered by the ODL concept). Even where commercial products have been developed, such as WebCT (Goldberg and Salari 1997) and Lotus LearningSpace (Lotus 1998), the integration between them will still need to be addressed. Initiatives such as Educom's Instructional Management System (IMS) architecture (Educom 1997) will potentially provide a solution here but, in the interim, establishments may develop courses that are difficult to share with other LRPs.

Another potential problem is that the resolution of technical issues may take precedence over the equally important issue of ensuring that appropriate organisational procedures and frameworks are in place to effectively support ODL delivery. This will include ensuring appropriate integration with institutional elements such as registration, finance and library systems. Such systems may successfully operate entirely independently in relation to face-to-face participants. However, when dealing with remote participants, all need to be accessible within the ODL framework. For example, registration details will ideally need to be accepted online and subsequent access attempts by students will need to be validated to ensure that they are registered and have paid their fees before allowing access to information. If the administrative systems in use are all from different vendors, then appropriate integration between them may be a non-trivial issue. The required level of integration should, therefore, be identified and planned for from the outset of the ODL strategy.

The actual creation of ODL courses must be considered and LRPs should not assume that existing courses may be simply transferred to ODL delivery as a matter of routine. It should be realised that their lecturers will be very unlikely to be proceeding from a common baseline of skills necessary to create ODL courses. Appropriate consideration will, therefore, need to be given to academic staff, such as providing them with the necessary training to create effective ODL materials and affording them sufficient free time to do so. Both of these issues can represent barriers to success and can only be effectively driven from the top within an LRP. The provision of supporting technologies (such as the Module Authoring Tool that the authors have developed) will also be of assistance in easing the problem of creating content.

A further concern that may be faced by both the LRP and remote participants is the security of the ODL framework, particularly given the inherently insecure nature of the Internet (which is the likely basis for most ODL solutions). A number of security requirements can be identified in the ODL context (Furnell et al. 1998), some of which are addressed by current products in the marketplace. The LRP will be concerned to restrict access to registered participants and protect the unauthorised dissemination or reuse of its intellectual property (e.g. course materials). This will introduce requirements for technologies such as authentication, digital signatures and watermarking. At the same time, participants will be concerned about the confidentiality of many of their interactions with the LRP and that of any materials that they submit for assessment. This leads to a role for cryptographic technologies. In addition, the overall integrity and availability of the service will also be of concern in terms of the reliability and usability of the system. Security requirements are likely to be increased if the LRP is a commercial organisation providing training to its own personnel about proprietary matters.

4.2 Other institutional concerns

A first observation is related to the fact that many establishments have already made significant inroads into the ODL market (for example, the UK Open University's advertising materials state that it already has 40,000 online students). Other establishments may consequently feel that they risk being left behind if they do not take some form of immediate action, prompting them to do make a commitment to ODL that may not be well-conceived. It can be argued that, ultimately, the principle of survival of the fittest will resolve this issue, with the weaker ODL providers either disappearing or being forced to revise their approach. However, it is desirable for organisations to avoid making poor entries into the market in the first instance and, therefore, they should attempt to learn from the examples and experiences of existing providers, using them as a model of good practice where appropriate. This may also provide a benefit in terms of justifying an ODL strategy within their own organisation, as reference to successful ODL adoption by another institution will prove that the potential benefits are more than vague, unsubstantiated claims (although it would also have to be shown that the successful approaches taken elsewhere would map onto the LRP appropriately).

The previously cited benefit that ODL provides an increased potential market for programmes (in terms of geographic catchment area) could also be considered to represent a threat to certain institutions. The removal of geographic boundaries could mean that some institutions become sidelined as others invade their market. The choice of one LRP over another would clearly be made on the basis of some form of competition (e.g. more attractive courses, delivery by recognised experts), which would be persuasive and advantageous from the participant's perspective. However, it is easy to see why this would be seen as a threat from the LRP viewpoint.

In the drive to attract participants, it is foreseeable that ODL providers could compete on the basis of gimmicks rather than purely on the quality of the courses and facilities that they are able to provide (e.g. offering free Internet access etc.). In a sense, this can be paralleled to the

current situation in which LRP prospectuses emphasise aspects such as their location and the surrounding environment, and it will ultimately be a matter of choice for the participants as to whether these aspects take precedence over the courses on offer.

5 Strategic advice to Learning Resource Providers

In view of the previous discussions, a general framework can be suggested for LRPs considering an ODL strategy. The figure below indicates a number of issues that should be addressed, from the academic and institutional perspectives (with some issues impacting both areas). Although the accompanying text is by no means an extensive set of guidelines, it does provide some principles that LRPs should refer to in order to help ensure that the potential benefits can be realised.

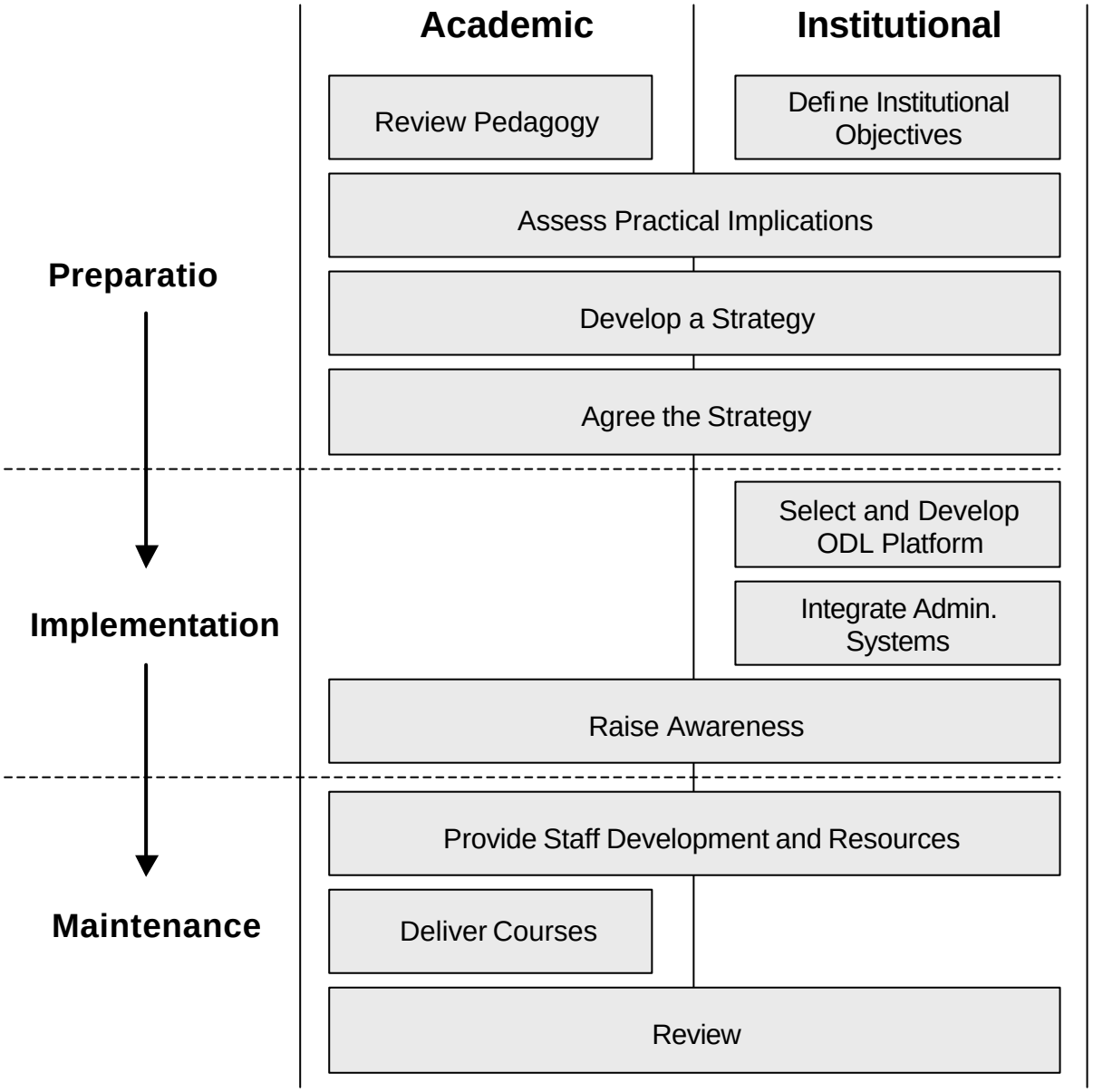

Figure 1: A framework for ODL strategy

- **Review Pedagogy**. Undertake a review of the pedagogic implications of ODL, incorporating the needs of the participants and the institution. This represents an important stage in terms of providing the necessary reassurance over educational value.

- **Define Institutional Objectives**. Identification and formalisation of the reasons for adopting ODL. Establishment of a steering group to drive the activities, encompassing the stakeholders in the development and implementation of the ODL platform.

- **Assess Practical Implications**. Consideration of the impacts that ODL may have upon the LRP and its staff. This will include issues such as effects upon staff workloads, network capacity and the like.

- **Develop a Strategy**. Show clear evidence of the strategy to the wider LRP membership. Make it open for discussion at the early stages and encourage feedback. Consult representatives from all stakeholder groups and do not purely select those people with pro-ODL views. The strategy should be updated to account for the feedback received, which may then require another iteration of the dissemination activity.

- **Agree the Strategy**. The finalised strategy will provide the basis from which to commence implementation activities and will also address how issues such as IPR and security are to be handled.

- **Select and Develop ODL Platform**. Assessment of available products and decisions regarding what (if anything) should be developed in-house. Administrative integration requirements should be recognised at this stage.

- **Integrate Administrative Systems**. Linkage of all administrative and support systems, such as registration and finance, into the ODL framework.

- **Raise Awareness**. Realise that there may be concerns over issues such as job security, IPR etc. and take steps to handle them. Although problems could arise at any stage, this represents the point at which the ODL strategy will have the greatest first-time visibility to staff and may, consequently, meet the most resistance.

- **Provide Staff Development and Resources**. The institution should provide a comprehensive programme of resources (e.g. development tools) and staff training, enabling the facilities and skills required to participate in an ODL delivery platform. Staff should be encouraged to use these provisions.

- **Deliver Courses**. Refers to the ongoing creation and running of online modules by academic staff. Feedback from course participants should be collected to help inform future decision making.

- **Review**. Maintain an ongoing review of the core features required by all stakeholder groups, to ensure that the ODL facility remains current. In parallel, maintain an ongoing review of new products and enable their incorporation into the basic platform as

appropriate. The potential for problems should also be recognised. Any of these issues may act as a trigger for a re-iteration of the overall process.

This approach should lead to smoother and more effective ODL implementation than might otherwise be the case.

6 Conclusions

The paper has presented a variety of the common criticisms levelled at the ODL concept and has attempted to either suggest reasons why the concerns may not be justified or approaches through which problems may be avoided. However, this is not to say that such problems will not occur in some institutions. As with any technological change, there is the potential for teething troubles before the full benefits are realised.

A key element that has not been addressed in this paper is the potential for concerns on the part of the ODL participants. At a general level, these may reflect some of the academic concerns highlighted earlier (e.g. regarding the quality of possible learning experiences). However, ODL is provided as an alternative to face-to-face delivery and if the participant feels that the disadvantages outweigh the benefits, then they can continue to choose traditional courses.

In conclusion, Online Distance Learning is, indeed, an area that offers significant promise to both LRPs and remote participants. However, an effective strategy is unlikely to be realised without an understanding of the barriers that may be faced. If such issues are considered from the outset, then the chances of successful implementation are considerably improved.

7 References

Alessi, S.M. and Trollip, S.R. (1991), *Computer-Based Instruction: Methods and Development*, 2nd ed. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Berners-Lee, T, Cailliau, R, Luotonen, A, Nielsen, H.F and Secret, A. (1994), "World-Wide Web", *Communications of the ACM* **37**, no.8: 76-82.

Carswell, L. (1997), "Does Internet Presentation Affect Learning Outcomes for Introductory Computing Students Studying through Distance Learning? Some Preliminary Results", Open University, Faculty of Mathematics and Computing, Milton Keynes, UK. http://cszx.open.ac.uk/publications.html.

Cochrane, P. (1995), "The Virtual University", *Business of Education*, Issue 5, March 1995: pp17-18.

DFEE. (1998). *The learning age: a renaissance for a new Britain*, Department for Education and Employment, The Stationary Office, ISBN 0 10 137902 1.

Educom. (1997), *IMS Design Requirements*, Educom Instructional Management System (IMS) Partnership, 19 December 1997. http://mic8.hensa.ac.uk/mirrors/ims -project/req.html.

Furnell, S.M, Onions, P.D, Bleimann, U, Gojny, U, Knahl, M, Röder, H.F and Sanders, P.W. (1998), "A security framework for online distance learning and training", *Internet Research*, Vol. 8, No. 3, pp. 236-242.

Furnell, S, Evans, M, Phippen, A, and Ali Abu-Rgheff, M. (1999) "Online Distance Learning: Expectations, Requirements and Barriers", *Virtual University Journal*, vol. 2, no. 2.

Furnell S.M, Evans, M.P, and Dowland, P.S. (2000) "Developing tools to support online distance learning", in *Proceedings of EUROMEDIA 2000*, May 8-10, 2000, (Antwerp, Belgium), pp. 199-206.

Goldberg, M.W. and Salari, S. (1997), "An Update on WebCT (World-Wide-Web Course Tools) - a Tool for the Creation of Sophisticated Web-Based Learning Environments", in *Proceedings of NAUWeb '97 - Current Practices in Web-Based Course Development*, June 12 - 15, 1997, (Flagstaff, Arizona).

Herkert, J.R. and Loui, M. (1999), "The ethics of Intellectual Property and the new Information Technologies", *IEEE Spectrum*, vol. 36, no. 8: 29-37.

Lee, W.W. and Mamone, R.A. (1995), *The Computer Based Training Handbook: Assessment, Design, Development, Evaluation*. Englewood Cliffs, NJ: Educational Technology Publications.

Lotus. (1998), *LearningSpace: Solutions for Anytime Learning*, White Paper, Lotus Development Corporation. http://www.lotus.com/home.nsf/tabs/learnspace.

Mengel, M. (1998). "IDEALS – Modular Courseware and a Task-oriented Authoring for on Demand Learning and Training Used in SMEs", *Proceedings of OnLine Educa Berlin 98*, December 2-4, Berlin, Germany, pp. 113-120.

Noble, D.F. (1998), "Digital Diploma Mills: The Automation of Higher Education", *Perspectives*, April/May 1998, pp. 9-14.

Poster, M. (1990), *The Mode of Information: Poststructuralism and Social Context*, Polity Press, Cambridge.

TeleEducation. (1999), *TeleCampus Online Course Directory.* http://telecampus.edu/