Organisational Patterns for E-Learning Centres

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Abstract: In this paper we will explore the notion of using organisational design patterns for the development of e-learning centres. We are using patterns to discuss some of the key aspects concerning the implementation of an e-learning centre within an institution, with an emphasis on the purposes and pedagogical principles that will help to successfully support such an initiative. This is one part of our work in progress for the EU Minerva project called ELEN. The ELEN research approach includes use of a qualitative survey of a set of existing e-learning centres across Europe, looking at their philosophy and organisational structures. We are using the survey findings to inform our pattern development work. The patterns are tangible resources, planned as part of a set of guidelines and action points for educational developers, to assist in the setting up and maintenance of pedagogically informed e-learning centres.

Introduction

Design patterns are being used as a means to capture and present solutions to design problems (eg Avgeriou *et al,* 2003; Frizell & Hubscher, 2002). They are also being used to facilitate communication among the members of a design team. Goodyear *et al* (2004) draw upon the organisational and communication framework derived from Christopher Alexander's work in architecture (eg Alexander *et al,* 1977) on pattern languages, to propose the use of patterns for participatory educational design work in higher education. Goodyear *et al* (2004) discuss using patterns in the design of networked learning environments, that is, environments for e-learning. They assert that designing for Higher Educational purposes, is a complex task which can benefit from better tools and methods.

Educational design work with current tools and methods reveals the difficulties in creating a balance between rigour and prescriptiveness *and* finding appropriate levels of generality, such that solutions to problems are worthy of being shared. Guidelines on best practice in educational design can be vague and unsupported by research, albeit presented as handy 'tips and tricks', but often they are without underpinning theoretical and practical rigour. Sometimes they can be too tightly prescriptive and specified so that they are seen as relevant only to certain contexts or situations. Design patterns are therefore intended to offer an alternative and flexible approach to design work that bridges between theory, empirical evidence and experience, and that help resolve practical problems in educational design. According to Frizell and Hubscher (2002) patterns are more flexible than static templates and yet more concrete than abstract guidelines. Patterns are proposed as a means to offer guidance but without constraining creativity.

But what do we understand by the term design pattern? According to Alexander, a pattern is a solution to a recurrent problem in a context. A pattern is used to:

> '*describe a problem that occurs over and over again in our environment, and then describes the core of the solution to that problem in such a way that you can use this solution a million times over, without ever doing it the same way twice.* (Alexander *et al*, 1977, pX)

Goodyear *et al* (2004) further claim that patterns have a teaching function, by being written in ways that help the reader understand enough of a problem and its solution and enable them to adapt the pattern to their own purposes. Patterns have value in illustrating a recurring problem and its solution. Alexander's position is explicitly value laden – he refers to 'quality without a name' – that his designs are seeking to nurture and create a convivial environment (Goodyear *et al,* 2004, p451).

Design patterns consist of a number of standard elements which have been drawn from the work of Alexander *et al* (1977) but were adapted for our purposes in educational design. A pattern normally begins with a NAME followed by the CONTEXT for the pattern (where the pattern fits within a pattern structure). The PROBLEM is next stated,

followed by some ANALYSIS of the problem. A SOLUTION is presented, drawing upon known solutions, followed by any CONDITIONS applicable to this pattern. Finally, RELATED PATTERNS are named, that is patterns that are integral to or directly associated with this pattern.

We have found in our work on design patterns that patterns need to be drafted, shared and critiqued through extensive collaborative moments: the information they present is not new or invented, rather it is derived from looking at examples of successful solutions (Frizell & Hubscher, 2002). Avgeriou *et al* (2003) assert

> *'patterns are not conceived in a big band but rather discovered or mined after numerous implementations of the same solution … usually by different people. It is a process of reverse engineering the systems that embed good design, in order to make that design explicit and to be able to communicate it to others.'*

This paper concerns the application of the pattern approach to an organisational design problem, namely that of setting up an e-learning centre. Designing organisational patterns for educational facilities such as e-learning centres will similarly benefit from an analysis of established e-learning centres as successful solutions and collaborative sharing and critiquing. This paper is therefore offered to open such discussions. The next sections of this paper outline the ELEN project work on e-learning centres and our qualitative survey of a set of existing European e-learning centres, before outlining our first attempts at an organisational design pattern for e-learning centres.

E-learning Centres

The ELEN project is funded under the Open and Distance Learning action of the European Commission's Socrates programme known as Minerva. E-LEN aims to create a network of e-learning centres and leading organisations to support a diverse constellation of e-learning centres around the world. Our interest in e-learning centres focuses on the key aspects in the implementation of e-learning centres within higher education institutions, with an emphasis on the pedagogical principles supporting such an initiative. An 'e-learning centre' is defined as:

> *a unit established for serving the learning needs of students and staff within an institution, for the deployment of innovative curriculum pedagogy and state-of-the-art learning technology in real courses, and for the development of new learning technologies guided by theory and validated by observation of practice.*
>
> (Steeples & Zenios, 2003)

As such, an e-learning centre has enhancement of the instructional process as one of its key goals. An e-learning centre can offer the following kinds of services: (i) support of academic staff, working with subject specialists to design and set in place the e-learning infrastructure for a course; (ii) development of e-learning courses, modules or programmes; (iii) production of new knowledge about e-learning; (iv) defining requirements for best e-learning practices and individualised e-learning approaches; (v) provision of pedagogic and technical e-learning solutions, suitable for innovative use in a variety of educational settings; and (vi) helping build next generation e-learning tools and services.

There is a strong rationale to identify established good practice in the implementation of e-learning. Firstly, organisations entering the e-learning field need to learn about the know-how, best practices and rules of thumb for implementing e-learning. Despite the progress made recently in the use of information and communication technologies (ICTs) in education, many institutions and organisations thinking of taking the step to implement electronic learning environments, face the problem of not knowing where to start from or what to do. According to Garrison & Anderson (2003) e-learning presents enormous opportunities and risks: thus there must be more than a fragmented approach. We argue e-learning centres have a critical, central role in the systemic take-up of e-learning.

Secondly, e-learning is currently a growing market and a field of rapid continuous development throughout the world. It is expected that the labour market requirements of the new knowledge economy will force higher education to extend the skills of students in respect to knowledge work, "information handling" and information and communication technology (ICT) skills. To make effective use of e-learning methods, and to meet these changing educational needs, groups of universities and other educational and training organisations will have to find ways of identifying and sharing best practices, collaborating in the exchange of experiences, tools and materials, etc.

A third reason is the need to establish more e-learning centres and enhance existing ones. Higher educational institutes and training centres have started to establish e-learning centres: to serve the learning needs of students; to

aid faculty and staff in the deployment of innovative curriculum, pedagogy and learning technologies, in real courses; and to develop new learning technologies guided by theory and validated by observation in practice. This is happening across Europe, though at very different rates of progress. Furthermore existing e-learning centres need to adopt best practices, in order to enhance and adapt to constantly changing e-learning demands.

Therefore, we regard the design and implementation of e-learning centres as such major tasks that they warrant careful planning and preparatory activity. A set of action points and guidelines for creating e-learning centres can help to maximise the potential of an e-learning centre. In ELEN we are additionally exploring the development of organisational design patterns to assist in the design and implementation of e-learning centres.

The E-Learning Centre Survey

To understand more about key aspects and issues facing e-learning centres, we have undertaken a qualitative research study of seven established e-learning centres that are based in higher education institutions across Europe. We have looked at the administrative, managerial, pedagogical, technical, research and developmental characteristics of these e-learning centres. The survey has examined the common issues faced and how problems are resolved among established e-learning centres (see eg Zenios & Steeples, 2004 for more on the survey)

The survey identified four distinguishable purposes or orientations for e-learning centres as follows:

- Type A: having a support or service role in the use of e-learning for teaching and learning
- Type B: having a support of innovation in e-learning role
- Type C: having an e-learning course development role
- Type D: having a research on e-learning role

These purposes of an e-learning centre can be developed into specific organisational design patterns. We have developed four patterns based around the four orientations identified for an e-learning centre, using the e-learning centre survey conducted earlier in the project work. In presenting a pattern for a support role e-learning centre, its overall purpose needs first to be set out. The pattern needs to identify the different kinds of centre activity and ways of organising those activities. The pattern needs to identify the kinds of issues faced and pitfalls to avoid. In the next section, we focus on the type A purpose of an e-learning centre, in which the centre has its central role in supporting the use of e-learning for teaching and learning

Organisational Design Patterns for E-Learning Centres

Here we present our initial draft for an organisational design pattern for setting up e-learning centres which have a support or service orientation as their key purpose.

NAME: An e-learning centre having a support or service role in e-learning teaching and learning

CONTEXT: Strategy for teaching and learning and assessment; Strategy for e-learning; E-Learning Management

PROBLEM: Institutions of higher education wish to set up support services as a centre to support academic staff across the institution in their deployment of e-learning for teaching and learning.

ANALYSIS: Institutions of higher education need advice about eg: best ways to set up an e-learning centre; about the resourcing needs; where the centre should be placed in the institutional infrastructure; what kinds of staff are needed and with what skills; and ways to organise and prioritise the centre's work. The design effort should focus on the creation of organisational forms for e-learning centres which favour the emergence of convivial working relationships both within and outwith the e-learning centre.

SOLUTION: The solution seeks to address the following aspects: vision, risk assessment, educational principles, infrastructure, infostructure, support services, budget and resources, a research and development framework, and benchmarking

Vision: The centre's vision needs to create alignment between pedagogy and technology but also to interface with research in e-learning. This kind of e-learning centre has the enhancement of the instructional process as central to its goals. This includes that the staff will normally work with subjects specialists to design and set in place the e-learning infrastructure for a course. This infrastructure includes eg learning materials, study guides, specifications for individual and group learning tasks and the various ICT tools needed by the learners and teachers. In this e-learning centre a broad range of skills is required among staff to achieve the centre's aims and objectives. For students the centre's activities can support flexible patterns of learning such as increasing support to part-time learners; encouraging learners to work more independently and be more creative; and widening access to resources.

If the centre's work is to be exciting, stimulating and forward-looking, it is important not to use technology simply as a substitute media for traditional teaching and learning functions. To do so would be to miss the opportunity presented by technology for new kinds of teaching and learning support. There is a need to pedagogically re-engineer courses to take account of new characteristics when technology is used and related learner needs. For example, the use of technology provides the centre with the ability to support teaching and learning operating both on- and outside campus and for academic programmes to reach geographically dispersed beneficiaries.

Risk assessment: Attention must be paid to the likely pressures on centre staff of how best to use their limited time and meet the increasing demands for their services. All centres of this kind will be under pressure to demonstrate that they are meeting the aims and objectives of the centre especially to meet the demands from academic staff to develop and support them in running e-learning courses. Centre staff need to be aware of the mismatches in, or unrealistic, expectations as more academics want to make use of e-learning. There is also need to encourage a sense of ownership for, and commitment to, e-learning developments especially at the faculty and departmental levels. The growth and increase in activities can also lead to an increase in immediate but primarily technical kind of problems, often requiring immediate responses. Centre staff need to be aware of the very real danger of them becoming a technical help desk service. Mechanisms for keeping up with technological developments must also be considered. Centre leaders also need incentives to keep centre staff with scarce skills in place, also suggesting the need to pull skills together so that centre staff can cover for each other. Funding resources are typically allocated in time-limited ways to e-learning centres eg, by placing centre staff on fixed term contracts. Evaluation of the centre's work needs to consider the wider contextual factors influencing take-up and sustained development of e-learning.

Educational principles: An e-learning centre needs to have a clear pedagogical framework that identifies and specifies the philosophical beliefs and values that underpin all aspects of the centre's work and development activities. The centre team need to be able to identify common values and beliefs eg about learning, in order to take a principled approach to their design and support of e-learning. This will encourage building good pedagogy into all design and development processes (Steeples, Jones & Goodyear, 2002) and foregrounds the need for systematic attention to pedagogical issues in design of e-learning.

Much of this kind of centre's staff time is likely to be spent on one-to-one consultancy work in developing applications and learning resources through collaborative projects with academic staff and helping staff in using ICT tools for teaching and learning purposes. The centre is central in encouraging academics to be more creative in their teaching and in finding ways to inspire learners and improve teaching quality It is typical that academic staff initiate much of this kind of centre's work, that is, the centre's activities are often determined by users or 'bottom-up' driven. Other academic-related activities are likely to include staff development work including running e-learning workshops and away days on the use of learning technology with some evaluation work of existing applications also likely. It is likely that the major part of a centre's work is primarily organised around projects, which could be funded through a 'competitive proposal process'. The process can be useful to help the centre prioritise its actions and to signal its role in selective, quality development activity.

A key role of an e-learning centre must be to support the development of e-learning skills in institutional staff. In particular, the development of staff skills in facilitation and management of online learning environments is essential. There is also a need to develop student skills in learning gaining the ability to learn in less passive and more interactive ways. The e-learning centre can assist learners and academic staff by providing the necessary guidance and support. Specialist skills and expertise are also clearly needed among the staff working within the e-learning centre. There are dangers in individual staff developing highly specialised skills and knowledge especially among a small e-learning centre team. Staff with skills and understanding that bridge between pedagogical and technological areas will be most valued.

Infrastructure: An institutional strategy for e-learning is critical. Centre staff will need clear lines of reporting and the centre needs to have a clear and appropriate place in the institutional structure. There needs to be a sense of fit with the institution and its teaching and learning strategy. A strategic approach is essential to ensure e-learning has the best possible chance to succeed, because of the complexity of stakeholders and variables in the mix. While many HE institutions have a strategy for teaching and learning in place, the extent to which they take account of learning mediated through technology, is much more piecemeal. An e-learning strategy is needed to give a forward vision for the institution, to help internal collaboration and to help align pedagogical, business and organisational processes (Ford *et al*, 1996).

Senior managers must be centrally involved in the development of an e-learning strategy and in the implementation of an e-learning centre. Senior management can promote the purposes and work of an e-learning centre to help give it a high profile within the institution. Senior management need to grasp the significance of developing and using technologies for teaching and learning. Integral to an institutional e-learning strategy is the need for an institutional infrastructure to be in place, allowing students and tutors to readily access electronic resources and support. The institutional e-learning strategy also needs to align organisational structures to centrally locate the e-learning centre, particularly in terms of its management, reporting mechanisms and quality assurance processes. Staff need to be aware of likely user perceptions that an e-learning centre has a technological focus rather than a pedagogical one. The organisational location of the centre and the line management is influential in this regard.

Infostructure: Systematic production and project management processes are critical within the centre, to ensure complex e-learning developments are properly funded and not under-resourced. This is especially true of expensive multimedia projects that commonly take much longer than anticipated. It is important that the e-learning centre activities are not trapped or bounded within limiting projects. There is a danger in staff spending their time on small-scale developments with no planning for the longer-term use of learning technologies beyond the funding period. This will diminish the opportunities for embedding and sustaining the development and for creating possibilities for reuse and adaptation to other teaching and learning situations across the institution.

Support services: The centre needs to have links and working relations with associated support services to ensure consistency, current awareness and the smooth integration of services across the institution eg linking into student support services, the library, staff development and audio-visual services, etc.

Budget and resources: The centre requires a budget for both staffing and resources, which may be derived from top slicing across the institution. Many centres are initially allocated funding for a limited period during which the institution monitors the success and impact of the centre's work, before committing to long-term support.

R&D framework: It is important to note that while this kind of e-learning centre may have research as part of its activities, the research orientation is not in the foreground of its mission. However, 'research is necessary to remain current and innovative … a research framework is imperative and must be built upon how people learn, how new tools support and assess learning goals and what … organisational structures support these gains (Garrison & Anderson, p108).

Benchmarking: Consistency in the quality of support across all users with the systematic handling of queries is likely to be a real and ongoing challenge. The systematisation of work processes, allowing tracking of progress and tracking of resources is suggested. These processes need to be designed to meet minimum quality standards.

RELATED PATTERNS: E-Learning Strategy; Learning Management; E-Learning Programme; E-Learning Environment; Discussion Tasks, ...

Conclusion

A major goal of most educational organisations today is to infuse technology throughout the instructional and administrative dimensions of the organisation. This has required not only the development of new levels of ICT knowledge and skill by academics and administrators, but has also resulted in changes in the role of the learning technology specialist and led to the formation of institutional e-learning centres.

We have presented in this paper a first draft pattern for an e-learning centre with an orientation towards supporting staff and students across the institution in their use of e-learning in teaching and learning. We are aware it may be regarded as currently operating at too abstract a level. We welcome discussion on making the pattern more tangible and practically-useful. In future iterations of organisational design patterns for e-learning centres we will suggest useful pedagogical approaches and also what pedagogical approaches are best avoided with e-learning. The patterns will also attempt to comment at policy and planning level as well as offering practical advice direct to practitioners. For example, the patterns will suggest how a centre might be structured and where it might be physically located.

Each design pattern for the different orientations of e-learning centres is being developed to both reflect the distinctions between them, as well as to incorporate similarities. As such they offer practical plans for design action to e-learning design teams. The patterns are being used to inform a principle deliverable of the E-LEN project: the Guidelines for e-learning centres document. This document will aim to assist people in setting up an e-learning centre, geared to enhance learning and teaching through the implementation of technology within an institution. The document will outline models of how established e-learning centres have been set up. It will suggest useful pedagogical approaches and identify the kinds of issues faced and the pitfalls to avoid. It will attempt both to comment at policy and planning level, as well as offering practical advice to practitioners.

References

Armitage, S & O'Leary, R (2003) A guide for learning technologists. E-Learning Series No. 4 York: LTSN Generic Centre

Avgeriou, P, Papasalouros, A, Retalis, S & Skordalakis, M (2003) Towards a pattern language for learning management systems. *Educational Technology & Society*, 6 (2), 11-24

DfES (2003) Towards a unified e-learning strategy. Consultation document, July 2003 (Available at http://www.dfes.gov.uk/)

Ford, P, Goodyear, P, Heseltine, R, Lewis, R, Darby, J, Graves, J, Sartorius, P, Harwood, D & King, T (1996) Managing change in higher education. Buckingham: SRHE/OU Press

Frizell, SS & Hubscher, R (2002) Aligning theory and web-based instructional design practice with design patterns. *Proceedings of the world conference on e-learning in corp., govt., health & higher education.* (1), 298-304

Frizell, SS & Hubscher, R (2002) Supporting the application of design patterns in web-course design. *Proceedings of the world conference on educational multimedia, hypermedia and telecommunications.* Denver, CO.

Garrison, DR & Anderson, T (2003) E-learning in the 21st century: a framework for research and practice. London: RoutledgeFalmer

Goodyear, P, Avgeriou, P, Baggetun, R, Bartoluzzi, S, Retalis, S, Ronteltap, F, & Rusman, E (2004) Towards a pattern language for networked learning. In Banks, S, Goodyear, P, Hodgson, V, Jones, C, Lally, V, McConnell, D & Steeples, C (Eds) *Proceedings of the Fourth International Networked Learning Conference.* Lancaster: Lancaster University

Goodyear, P (2001) Learning and digital environments: lessons from European research. In O'Fathaigh, M, (Ed) Education and the information age: current progress and future strategies, Cork: Bradshaw Books

Goodyear, P & NLinHE team (2000) *Effective networked learning in higher education: notes and guidelines*. Available at http://csalt.lancs.ac.uk/jisc/advice.htm

Raschke, C (2003) *The digital revolution and the coming of the postmodern university*. London: RoutledgeFalmer

Resta, PE (2002) The IT specialist. In Adelsberger, HH, Collis, B & Pawlowski, JM (Eds) *Handbook on information technologies for education and training*. Berlin: Springer

Rosenberg, MJ (2001) *E-learning: strategies for delivering knowledge in the digital age*. New York: McGraw-Hill

Steeples, C, Jones CR & Goodyear, P (2002) Beyond e-learning: the future for networked learning. In C Steeples & C Jones (Eds) *Networked learning: perspectives and issues*. London: Springer

Steeples, C & Zenios, M (2003) *E-LEN: a network of e-learning centres: Report on the survey of e-learning centres* (Deliverable WP 1, E-LEN project). Lancaster: CSALT (Centre for Studies in Advanced Learning Technology).

Urdan, T & Weggen, C (2000) *Corporate e-learning: exploring a new frontier*. WR Hambrecht & Co

Zenios, M & Steeples, C (2004) Developing and delivering pedagogically informed technology for meaningful learning experiences within institutions: action points for creating e-learning centres. In Banks, S, Goodyear, P, Hodgson, V, Jones, C, Lally, V, McConnell, D & Steeples, C (Eds) *Proceedings of the Fourth International Networked Learning Conference.* Lancaster: Lancaster University

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