

Towards a pattern language for networked learning

Proposal for a research paper presentation at Networked Learning 2004

Peter Goodyear (corresponding author)

Co-authors

Paris Avgeriou, Rune Baggetun, Sonia Bartoluzzi, Simeon Retalis, Frans Ronteltap, Ellen Rusman,

Main conference theme addressed: *designing for networked learning*

Address for correspondence:

Prof Peter Goodyear

CoCo, Faculty of Education & Social Work (A35),

University of Sydney,

NSW2006, Australia

p.goodyear@edfac.usyd.edu.au

Abstract

An assumption underpinning the work reported in this paper is that designing for networked learning is a complex task which could benefit from better tools and methods. Existing approaches to supporting design are not very satisfactory. In particular, it is hard to strike an appropriate balance between rigour and prescriptiveness and to find appropriate levels of generality. Practitioners, quite reasonably, complain if the 'guidance' they are given appears too vague or is unsupported by research. Equally, they resist tight prescription – whether it be prescription of the technology to be used, or the pedagogical strategies to be employed.

The paper presents some outcomes of work from the EU-funded E-LEN project – work which has focussed on the idea of design patterns and a pattern language for networked learning. The original ideas for design patterns and pattern languages come from the writings of Christopher Alexander on architecture and town-planning - see, for example, Alexander (1979); Alexander et al (1977). Alexander's intention was to democratise architecture and town-planning by offering a set of conceptual resources that ordinary people could use in (re)shaping their environment. His work provides a principled, structured but flexible resource for vernacular design. In our view, he strikes the right balance between rigour and prescriptiveness – offering useful guidance without constraining creativity and providing helpful foci for design.

The notion of design patterns has been picked up more recently within the field of software engineering – where it has been used to capture and share aspects of software engineering experience and as a way of representing successful models for the implementation of information systems (see e.g. Gamma et al., 1995). Teachers of

software engineering have also been experimenting with the idea of pedagogical patterns and educational technologists have been trying to apply a pattern-based approach to working on problems such as learning object descriptions, inter-operability, learning management standards, etc (Eckstein et al., 2001; Frizell & Hubscher, 2002; Avgeriou et al., 2003).

This paper goes back to Alexander's work and attempts to provide (a) a concise summary of what is distinctive about the pattern-based approach and what it can offer to the task of designing for networked learning, (b) some example design patterns for networked learning, and (c) an account of how design patterns can be combined to form a pattern language.

Design patterns have a number of qualities which, in combination, give them the potential to be a useful way of sharing experience in the field of networked learning. A pattern is a *solution* to a *recurrent problem* in a *context*. In Alexander's own words, a pattern "describes a problem which 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, p.x). Context is important in helping constrain and communicate the nature of both problem and solution. Describing the context for the problem and its solution avoids over-generalisation. In addition, patterns should also *teach*. They should be written in such a way that they help the reader understand enough about a problem and solution that they can adapt the problem description and solution to meet their own needs. The *rationale* for the pattern helps with this teaching or explanatory function. Ideally, the *name* of the pattern should crystallise a valued element of design experience and help relate it to other design elements such that we can create and use a pattern language.

The use of patterns, then, can be seen as a way of bridging between theory, empirical evidence and experience (on the one hand) and the practical problems of design.

To help make the pattern-based approach more readily comprehensible to people working in the field of networked learning, the paper includes a number of Morten Paulsen's pedagogical techniques for CMC rendered as Alexandrian patterns (Paulsen, 1995).

The paper concludes with an outline of a process by which design patterns can be shared, critiqued and refined through collaboration within the networked learning community. Participants in the Networked Learning conference will be invited to contribute to this process in the period after the conference.

References

- Alexander, C. (1979). *The timeless way of building*. New York: Oxford University Press.
- Alexander, C., Ishikawa, S., Silverstein, M., Jacobson, M., Fiksdahl-King, I., & Angel, S. (1977). *A pattern language: towns, buildings, construction*. New York: Oxford University Press.
- Avgeriou, P., Papasalouros, A., Retalis, S., Skordalakis, E. (2003) Towards a Pattern Language for Learning Management Systems, *Educational Technology & Society*, 6, 2, 11-24, <http://ifets.ieee.org/periodical/6-2/2.html>
- Eckstein, J., Marquardt, K., Manns, M., & Wallingford, E. (2001). *Patterns for experiential learning*. Paper presented at the EuroPLoP 2001 conference.
- Frizell, S., & Hubscher, R. (2002). *Supporting the application of design patterns in web-course design*. Paper presented at the ED-MEDIA 2002 conference.
- Gamma, E., Helm, R., Johnson, R., & Vlissides, J. (1995). *Design patterns: elements of reusable object-oriented software*. New York: Addison-Wesley.
- Paulsen, M. (1995) *The on-line report on pedagogical techniques for computer-mediated communication* (<http://www.nki.no/~morten>)