Assessing the value of design narratives, patterns and scenarios in scaffolding co-design processes in the domain of technology enhanced learning

Yishay Mor

yishaym@gmail.com

Steven Warburton

University of Surrey, UK, s.warburton@surrey.ac.uk

Abstract

In order to promote pedagogically informed use of technology, educators need to develop an active, inquisitive, design-oriented mind-set. Design Patterns have been demonstrated as powerful mediators of theory-praxis conversations yet widespread adoption by the practitioner community remains a challenge (Goodyear et al., 2004). Over several years, the authors and their colleagues have facilitated many workshops in which participants shared experiences, captured these as design narratives, extracting design patterns, and applied them to novel teaching challenges represented as design scenarios. This paper analysis the value of design narratives, patterns and scenarios in scaffolding co-design processes in light of previous work in this area.

Keywords

learning design, design patterns, design narratives, scenarios, co-design

Introduction

Educators are confronted daily with the challenging task of preparing young people for a complex and demanding world. Dewey (2007) argues that the role of education is to provide experiences that promote growth - not just in the course of the experience itself, but in setting up the conditions for further growth through future experiences. Arguably, such a mission requires educators to perceive themselves, and be acknowledged by others, as designers of learning. Here, we perceive design both in the sense of Herbert Simon, as "changing an existing state of the world into a desired one" and in the view of Donald Schön as a "reflective conversation with the materials of a conversation". Indeed, Schön (1992a) draws many parallels between teaching, learning and design:

> "When we attend to what we know already, appreciating the artistry and wisdom implicit in competent practice, believing that by reflection on that practice we can make some of our tacit knowledge explicit, we take on a "reflective turn", that leads us to see students and teachers (at their best) as participants in a kind of reflective practice, a communicative and self-reflective practice of reciprocal inquiry."

Schön concludes:

> "From the perspective of designing as learning and learning as designing, the teaching/learning process could be seen, at its best, as a collaborative, communicative process of design and discovery."

If we want education to respond to the ever-shifting environment we live in, and address the challenge of providing learners with experiences that foster continuous growth within this environment, there is a clear imperative for reconceptualising education as learning design - or as a design inquiry of learning. This objective appears elusive in an era where, for example, the notion of networked learning contributes to a reconfiguration of the relationship between the learner and the teacher (Dirckinck Holmfeld et al., 2012).

Mor, Craft & Hernández-Leo (2013) claim that the "grand challenge of learning design" can be summarised in three words: language, practices, and tools. Language is the representational fabric - verbal, graphic, formal, computational and other - in which we formulate, share, and critique design knowledge in education. This knowledge encapsulates epistemic knowledge-creation practices and the corresponding pedagogical practices, but we also need to establish valid, robust and agile practices of design. Finally, we need tools that embody and support these practices and allow us to efficiently manipulate, share, store and retrieve constructs in these languages.

The SNaP! (Scenarios, Narratives and Patterns) framework (Mor, 2013) offers a contribution in terms of language and practices. Although it does not refer to any particular tool, it is not tool-agnostic. Instead, it defines a set of constraints, requirements and preferences on a range of tools. This framework is somewhat abstract, and needs to be manifested through concrete methodologies of action. Indeed, two such methodologies have been developed and tested extensively: the Learning Design Studio methodology (Mor & Mogilevsky, 2013a; 2013b) and the Participatory Pattern Workshop (Mor, Warburton & Winters, 2012). The first is a platform for action, the second emphasises collaborative reflection. Together, they fulfill Schön's ideal of collaborative, communicative, reflective conversations with the materials of a situation.

This paper presents the SNaP! framework in brief, examines it's reflections in the Learning Design Studio (LDS) and Participatory Pattern Workshops (PPW), and considers a future scenario in which the two may be combined as a basis for professional development.

The SNaP! building blocks

The SNaP! framework addresses the need to represent, share, reuse and manipulate design knowledge in education. It consists of three representations - design narratives, design patterns and design scenarios, and a set of practices for constructing and using these representations.

Design Narratives
Design is a messy business. As Schön (1992a) and Béguin (2003) note, designers introduce innovations into a situation based on their reading of the situation, but in doing so, change the situation itself, and inevitably cause different effects than they expected. Schön (1992b) stresses that design knowledge is predominantly tacit, knowledge-in-action. How do we make it explicit? How can the designer make sense of her experience, draw conclusions from it and use them to inform future experiments? Design narratives harness the innate epistemic power of story-telling for this purpose.

Jerome Bruner (1991) has shown that narrative is a fundamental innate epistemic force: we weave our experiences into stories in order to extract, and share, meaning from them. Design narratives leverage this force, but provide structure and rules which turn the outcome into a scientific construct.
Design narratives[1] provide an account of the history and evolution of a design over time, including the research context, the tools and activities designed, and the results of users' interactions with these. They include an honest portrayal of the challenges encountered along the way, and how these were resolved. In order to adhere to scientific standards, design patterns need to be clearly traceable to data and explicit about their methods of analysis. In contract with "natural" or literary narrative, they also need to state their conclusions openly so that these are open for scrutiny. Mor (2013) outlines criteria for validity of design narratives, and selection rules for including them in a body of evidence.

Design Patterns
Design narratives offer thick descriptions of innovations, but they are often too specific to lend themselves to efficient transfer to novel challenges. Design patterns fill this gap by offering a "grounded abstraction" of design knowledge distilled from design narratives. Design patterns originate in the work of Christopher Alexander and his colleagues in the theory of architecture (Alexander, 1977).

---

[1]

Proceedings of the 9th International Conference on Networked Learning 2014, Edited by: Bayne S, Jones C, de Laat M, Ryberg T & Sinclair C.

ISBN 978-1-86220-304-4

519

A design pattern[2] describes a recurring problem, or design challenge, the characteristics of the context in which it occurs, and a possible method of solution. Patterns are organized into coherent systems called pattern languages where patterns are related to each other. The core of a design pattern can be seen as a local functional statement: "for problem P, under circumstances C, solution S has been known to work".

Design Scenarios
Design scenarios[3] borrow the form of design narratives, adapting it from an account of documented past events to a description of imagined future ones. Design scenarios retain the same basic components that constitute design narratives: context, challenge, theoretical framework, events and actions, results and reflections. However, these elements reflect a hypothesis about possible future states of the world. The context describes a current, existing situation, which is perturbed by the introduction of new material, social and intentional elements such as new technologies, new practices, or new objectives. Consequently, the challenge component may describe an existing conflict of forces, which is altered by the introduction of new contextual elements. Alternatively, it may consist of altogether new requirements arising from the reconfiguration of forces, such as the satisfaction of novel objectives. At the heart of a design scenario are a sequence of actions the protagonists may take to achieve their objectives, events which they may encounter and their reactions to these, and finally – the ensuing results of this sequence. These actions, event, and consequent results are afforded or driven by the qualities of new artefacts introduced into the context. Thus, they express a design claim: that introducing such artefacts into such a context may induce such results. However, this claim is stated in a thickly grounded form, submitting it to elaborate scrutiny.

Building with the blocks - Learning Design Studio (LDS) and Participatory Pattern Workshops (PPW)

The combination of design narratives, patterns and scenarios has been used successfully in two methodologies of action: the Participatory Pattern Workshop methodology for collaborative reflection and the Learning Design Studio methodology for training educators as learning designers.

Participatory Pattern Workshops
The Participatory Pattern Workshops methodology (Mor, Warburton & Winters, 2012), also called the "Participatory Methodology for Practical Design Patterns", is a process by which communities of practitioners can collaboratively reflect on the challenges they face and the methods for addressing them. The outcome of the process is a set of design narratives, design patterns and design scenarios situated in a particular domain of practice. At the heart of this process are three Collaborative Reflection Workshops:

- A Design Narratives Workshop, which provokes collaborative reflection among practitioners by a structured process of sharing stories.
- A Design Patterns Workshop, where participants use comparative analysis of design narratives to define proto-patterns and elaborate these by articulating the problem, context, core of the solution and related patterns.
- A Design Scenarios Workshop, in which participants put patterns to the test by applying them to novel problems in real contexts.

Learning Design Studio
The Learning Design Studio (LDS) is a collaborative, blended, project based framework for training teachers in effective and evidence-based use of educational technology (Mor, & Mogilevsky, 2013a; 2013b). This approach is modelled after the tradition of studio-instruction in arts and design disciplines (Green & Bonollo, 2003), and reflects a pedagogy of *Design Inquiry of Learning* (DIL): a projection of the ideal of design science into realistic settings. DIL combines an inquiry-based learning approach with a design-based scientific paradigm. In the studio model, the main activity of a course is the students' continued work on design challenges in a defined domain of practice. Students typically work in groups. They identify an educational challenge, research it, and

---

2
        http://www.ld-grid.org/resources/representations-and-languages/design-patterns

3
        http://www.ld-grid.org/resources/representations-and-languages/design-scenarios

devise innovative means of addressing it. The course instructor guides the students through the process, and classroom sessions are mostly dedicated to group work and public review of design artefacts.

The LDS uses scenarios, narratives and patterns - but in a different sequence and a different mindset than PPW. Whereas the objective of PPW is reflective and analytic, the LDS is a site of experiential learning through educational innovation. Participants first conceptualise their project plans in the form of a draft scenario, they then consult existing design patterns and design principles (Kali, 2006) to elaborate their scenario. They proceed to prototype their proposed solution and evaluate it, and conclude the process by writing reflective design narratives.

Results

The PPW methodology has been used with experts from a range of domains that have included feedback and assessment processes, virtual worlds for teaching, managing digital identity. In each case the full cycle of workshops have been completed and some of these outputs have been archived on the pattern language network site[4], which lists over a hundred design narratives, close to thirty design patterns and thirteen scenarios. The published work has included the formative e-assessment strand (Daly, Pachler, Mor, & Mellar, 2010; Mor, Mellar, Pachler, & Daly, 2010), which produced nine design narratives, five of which were selected for publication, and 10 patterns gathered during the JISC funded FEASST project. The later work spread into the domain of virtual worlds and during the EC funded MUVEnation project, teachers and educational researchers produced 28 design patterns, over 80 case stories and more that 20 design scenarios in the use of virtual worlds for learning and teaching (Warburton, 2009). Finally, during the Rhizome project, a group of experts were brought together in the production of 11 design patterns and more than 25 case-stories in the domain of digital identity management (Warburton, 2013). Recently, the methodology has been used with promising results by the ML4D project[5] in the domain of mobile learning for development.

In summary, the PPW has been an effective methodology in two key ways; First, the abstraction of design knowledge from narratives into a design pattern format. Second, in bringing a community of experts together and, through an intensive process of reflection, creating a transformative experience for all participants. Yet the intensive nature of these workshops brings with it a requirement for commitment and sustained effort. Both from the facilitators - to scaffold and thread participant activity through each of the workshop stages - and from the participants who are required to work through cases and problems between the workshop meetings. What has also become apparent, reflected in the output numbers, is that the application of design patterns to the production of concrete design solutions, articulated as design scenarios has been consistently difficult to achieve. This is particularly evident where an oscillation between design thinking and practice has been required.

The learning design studio format has been trialled in four different course settings: two at the Technologies in Education postgraduate programme at the University of Haifa during the academic year 2010-2011, one in the Open Learning Design Massive Open Online Course (OLDS MOOC) and in one course in The Open University's Master in Open and Distance education programme. The University of Haifa courses both ran for 13 weeks in a blended format (2 hours face time, 4 hours independent study). The first included 22 students, who split into 9 project groups. The second included 17 students in 6 project groups. All students passed, and all projects were completed, most to a high standard. The OLDS MOOC (http://olds.ac.uk) ran for nine weeks, from January to March 2013. Evaluation of the OLDS MOOC reveals that while many participants found the experience fruitful, informative and rewarding - the collaborative project aspects of the MOOC did not materialise as planned (Cross, 2013; McAndrew, 2013). Participants did engage with design patterns, design narratives and design scenarios; About 60 scenarios were published by participants in week 2, some with over 20 comments from peers. About 25 narratives were published by participants in week 8, and again - some received more than 20 peer comments. However, this engagement was predominantly as isolated experiences rather than as a cohesive language and a system of practice within a community. The OU case was a seven week block out of the 30 week MA course "openness and innovation in elearning". The course had 70 students registered and was taught fully online with the students expected to commit 14 hours a week. The students were

---

4

http://web.lkldev.ioe.ac.uk/patternlanguage/xwiki/bin/view/Main/

5

http://www.ml4d.org/

assigned to 11 project groups based on their choice of project subject. Most of the projects were of exceptional quality.

Reflecting on the evaluations of the LDS process we find some similarities with the comments on the PPW. For example, during the OU course, while many students reported an enriching and rewarding experience, most noted the intensity and demanding nature of this block of study. The LDS process is a demanding one - both for the students and the tutors. It requires the preparation of a varying amount of scaffolding depending on the particular context i.e. whether the course is delivered in a blended or entirely online mode. Many students were unsettled by the unfamiliar pedagogical process. The nature of the LDS methodology foregrounds innovation and questioning of a problem space. In the design studio approach this means that 'getting lost' becomes part of the rite of passage to producing successful, meaningful and purposeful designs. Furthermore, innovation, by nature, can fail. It is important to guide the students to an understanding that a failed project can still be a valuable learning experience.

Looking forward: towards a comprehensive training programme
As an instrument for considering the future possibilities for the SNaP! framework, we present a design scenario that deploys both LDS and PPW as a component of an MA programme in Higher Education at the University of Surrey.

Context:
The MA in Higher Education programme is firmly rooted in academic practice and is being designed, in its' first iteration, to run with university teachers. It will be delivered in an entirely online format and the modules that address technology enhanced learning provide an opportunity to interrogate educational technology deployment in the authentic contexts that the participants bring with them. These contexts are being increasingly dominated by the challenge that teaching in a networked learning setting presents and the acknowledgment that digital networks have become an essential part of the learning environment (Dirckinck-Holmfield, 2009).

Our Challenge: connecting theory and practice.
How do we make theory relevant to practitioners, and at the same time develop a scientific attitude towards their work? The disconnect between theory and practice is a well-documented weakness of teacher training programs (Mellar, Oliver & Hadjithoma-Garstka, 2009; Davies, 1999). Korthagen et al (2001) show that not only do teachers find themselves ill-equipped to translate the theoretical abstractions to the concrete context in which they work, their negative experience in attempting to do so results in theory aversion: teachers feel threatened by educational theory and see teacher education as detached and useless.

Our Solution: combining LDS and PPW approaches as a programme component
We envision a component in the MA programme, which includes two modules: the first, structured as a learning design studio, offers students an opportunity to engage in educational innovation, while maintaining a rigorous view and making their own connections with theory. The second, modelled after the Participatory Pattern Workshops, leads them through a process of collaborative reflection and cumulates in the production of a publishable paper.

Learning Design Studio Module
We begin with a 15 credit module. Students work in groups on projects as described in the LDS methodology and prototype solutions in their particular domain of inquiry. We begin by introducing the methodology itself, through review papers and example projects. The course ends with an open "crit", where students present their projects to a wide audience.

Participatory Pattern Workshop Module
In a second 15 credit module, student use narratives, patterns and scenarios to collaboratively reflect on their practical experiences. They can accomplish this either by reference to the LDS module or to other modules in the programme. First, they share narratives from their projects and critique their peers' narratives, using a given evaluation rubric. They refine their narratives in response to comments, and proceed to elicit patterns from common theme identified across narratives. These patterns are substantiated by reference to relevant literature, and connected to form pattern languages. The students then validate these patterns by using them to construct solutions for novel scenarios. Finally, working in groups, the students collate narratives, patterns and scenarios to form publishable papers.

Conclusions

The combination of the two learning design approaches documented in this paper provides a powerful and complementary dual learning process. It engenders the development and then application of deep and meaningful design knowledge with a reflective conversation that directly interrogates their practical experience. We are confident that this novel approach will produce both deep learning and innovative thinking.
The SNaP! framework provides both a comprehensive set of representations and a system of practices for articulating, sharing, aggregating and manipulating design knowledge in education.

References

Alexander, C.; Ishikawa, S. & Silverstein, M. (1977). *A Pattern Language: Towns, Buildings, Construction* , Oxford University Press , New York

Béguin, P. (2003). 'Design as a mutual learning process between users and designers', *Interacting with Computers* 15 (5) , 709-730

Bruner, J. (1991). 'The Narrative Construction of Reality', Critical Inquiry 18 , 1-21

Cross, S. (2013). *Evaluation of the OLDS MOOC curriculum design course: participant perspectives, expectations and experiences.* OLDS MOOC Project, Milton Keynes http://oro.open.ac.uk/37836/

Davies, P. (1999). What is evidence-based education? *British journal of educational studies* 47(2):108-121.

Dewey, J. (2007). *Experience and education*. Simon and Schuster: New York, NY

Dirckinck-Holmfield, L., Jones, C. and Lindström, B. eds. (2009). *Analysing Networked Learning Practices in Higher Education and Continuing Professional Development.* Rotterdam: Sense Publishers.

Dirckinck Holmfeld, L., Hodgson, V., & McConnell, D. (Eds.). (2012). *Exploring the Theory, Pedagogy and Practice of Networked Learning*. Springer Verlag.

Goodyear, P., Avgeriou, P., Baggetun, R., Bartoluzzi, S., Retalis, S., Ronteltap, F., and Rusman, E., (2004). Towards a Pattern Language for Networked Learning. *Proceedings NLC 2004*. Retrieved 10th January 2014 http://www.networkedlearningconference.org.uk/past/nlc2004/proceedings/individual_papers/goodyear_et_a l.htm

Green, L. N. & Bonollo, E. (2003). Studio-based teaching: history and advantages in the teaching of design. *World Transactions on Eng. and Tech. Edu*, 2, 269-272.

Kali, Y. (2006). Collaborative knowledge building using a design principles database. *International Journal of Computer-Supported Collaborative Learning*, *1*, 187–201.

McAndrew, P. (2013). Learning from open design: running a learning design MOOC. *eLearning Papers*(33)

Korthagen, F., Kessels, J., Koster, B., Lagerwerf, B., & Wubbels, T. (2001) *Linking practice and theory: The pedagogy of realistic teacher education*. Lawrence Erlbaum.

Mellar, H., Oliver, M., Hadjithoma-Garstka, C. (2009). The role of research in institutional transformation, *in T. Mayes; P. Bullen; H. Mellar & M. Oliver*, ed., 'Transforming Higher Education through Technology-Enhanced Learning' , Higher Education Academy, York, UK.

Mor, Y.; Craft, B. & Hernández-Leo, D. (2013). Editorial: The art and science of learning design. *Research in Learning Technology*. 21

Mor, Y.; Mellar, H.; Pachler, N. & Daly, C. (2010). Formative e-Assessment: case stories, design patterns and future scenarios, *in Christian Kohls & Joachim Wedekind*, ed., 'Problems Investigations of E-Learning Patterns: Context Factors Solutions' , Information Science Publishing, Hershey, PA. 199-219.

Mor, Y. (2013). SNaP! Re-using, sharing and communicating designs and design knowledge using Scenarios, Narratives and Patterns, in Rosemary Luckin; Peter Goodyear; Barbara Grabowski; Sadhana Puntambekar; Niall Winters & Joshua Underwood, ed., *'Handbook of Design in Educational Technology'* , Routledge, pp. 189-200

Mor, Y. & Mogilevsky, O. (2013a). 'The Learning Design Studio: Collaborative Design Inquiry as Teachers' Professional Development', *Research in Learning Technology* 21.

Mor, Y. & Mogilevsky, O. (2013b). Learning design studio: educational practice as design inquiry of learning 'Scaling up Learning for Sustained Impact' , Springer: Berlin Heidelberg, pp. 233--245.

Mor, Y.; Warburton, S. & Winters, N. (2012). 'Participatory Pattern Workshops: A Methodology for Open Learning Design Inquiry', *Research in Learning Technology* 20.

Schön, D. A. (1992a). 'The theory of inquiry: Dewey's legacy to education', *Curriculum inquiry* 22 (2) , 119-139

Schön, D. A. (1992b). *'Designing as reflective conversation with the materials of a design situation'*,Knowledge-Based Systems 5 (1) , 3-14

Warburton, S. (2009). WP4c Report on Design Patterns for Virtual Worlds. Retrieved 10 October 2013 at http://dl.dropbox.com/u/4424450/KCL_v6_MUVENATIONDesignPatternsWP4.pdf

Warburton, S. (2013). Space for Lurking: a Pattern for Designing Online Social Spaces. *In Warburton and Hatzipanagos (Eds.)* Social Media and Digital Identity. p149-158. Hershey, PA: IGI Global.

Proceedings of the 9th International Conference on Networked Learning 2014, Edited by: Bayne S, Jones C, de Laat M, Ryberg T & Sinclair C.

ISBN 978-1-86220-304-4

523