Overview

♣ Background: The Kaleidoscope Network

♣ A Methodology for design and education

♣ Getting to grips with our approach... a brief workshop

♣ Outputs and Findings

♣ Discussion

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Kaleidoscope

♣ European research network –
- over 90 research units
- across 24 countries
- with over 1000 research members

♣ Integrates leading research teams, who work collaboratively across educational, computer and social sciences to transform the quality and reach of the learning experience

♣ Fosters innovation and creativity through development of new technologies, methodologies and concepts, defining challenges and solutions for interdisciplinary research

♣ http://www.noe-kaleidoscope.org/

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The Learning Pattern Project

- ♣ Jan 2006 – Jan 2007, 7 partners across Europe:
    - θ FI, TCD, GU, UA, ITD,UW, IoE
- ♣ Explore the potential of games for mathematical learning
- ♣ Acknowledge the barriers to realizing this potential, both in *development* and in *deployment = multidisciplinary*
- ♣ Practice ▶ research ▶ practice

The significance of design for educational practitioners

♣ Teachers
- Lesson planning
- Setting tasks
- Topic planning

♣ Educational researchers
- Experimental design
- Activity schedules

♣ Developers
- Curriculum development
- Software development

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The significance of design for educational practitioners

♣ Yet much of that design effort remains under theorised

♣ Teachers, researchers, developers and policy makers tend not to be in a position to base their design decisions either on:

- θ Theoretical models of the design process
- θ Prior experience as there is no agreed framework for capturing that experience.

♣ What we do have is an emerging methodology which is promising to provide fresh insights into both design and learning

Iterative design

♣ Phases of design and phases of testing are interleaved so that each phase informs the other

♣ The intention is to develop theory that encompass both the design of the product in the study and the activity of the learners as they engage with that product

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Focus: Design patterns

♣ Historically, a dipolar structure:
- θ the construction of design patterns for mathematical games
- θ the deployment of games.

♣ The aim is to capture the relationship between design and use of games in 'learning patterns', consisting of:
- θ An introductory paragraph, which sets the *context* for the pattern
- θ A concise *problem statement*
- θ The *body* of the problem—it describes the empirical background of the pattern, the evidence for its validity, the range of different ways the pattern can be manifested
- θ The *solution* that describes the relationships required to solve the stated problem, in the stated context. It is preferable to state the solution in the form of an instruction. A *diagram* may be included here.
- θ A relationship between this pattern and others.

♣ Abstractions of practices

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Iterative design

Phase 1	Phase 2	Phase 3	Phase 4
Pattern Development by interdisciplinary team	Paper description of patterns in a pattern language	Use of these patterns in collaborative, interdisciplinary processes between developers, teachers, students, researchers, and designers in the development of games	Use of resulting games and associated pedagogies in the classroom

Getting to grips with our approach...
a brief workshop

http://lp.noe-kaleidoscope.org

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Overarching Finding

♣ We have demonstrated the feasibility of mapping the relationship between the design and deployment of mathematical games and has done so by putting in place a methodology which could be use to continue the design research that this project has begun.

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Specific Findings

♣ This project has shown that:

- θ The relationship between the design of mathematical games and their deployment is deep, complex and structured.

- θ This relationship can be successfully explored through the collaborative efforts of the design and practitioner communities.

- θ The relationship between the two can be captured in an extensive set of learning patterns with a highly defined and common structure.

- θ The ontology of those learning patterns can be structured as a hierarchical map.

- θ The map potentially enables access by interested communities to a relatively small set of high level patterns after which the user may wish to drill down to more specialised cases.

- θ Creating and understanding the map is non-trivial.

- θ The methodology developed within this project may provide the key towards the construction of a more exhaustive map.

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