Laureate Fellowship Program of Research (excerpt)
Note: this is extracted from the 10 page description in the research proposal and is intended to give a flavour of the work to be undertaken by the Laureate Fellowship team over the next 4-5 years.

Project title
Learning, technology and design: architectures for productive networked learning

Aims

… The area known as ‘the learning sciences’ has emerged over the last 20 years as a highly-successful multi-disciplinary endeavour combining research in cognitive science, education, computer science, anthropology, sociology and neuroscience. Its goal is to understand learning – in individuals, groups, organisations and other complex socio-technical systems, such as online networks and communities. Its structure and methods reflect the fact that the many influences on learning operate at different scale levels: ‘from neurons to neighborhoods’. In addition to this quest for fundamental understanding, research on learning is also ‘use-inspired’. It contributes to the improvement of teaching, but also – in much more extensive ways – to the design and iterative enhancement of tools, resources, techniques and processes that have a significant influence on the quality of people’s learning: formal, informal, lifelong and lifewide.

Learning in a networked society involves complex, shifting configurations of tasks, tools and people, with new distributions of activity across time, space and media. Research on networked learning needs analytic concepts and techniques that can cope with complexity and change; designing for networked learning must be similarly sharp and agile. This Fellowship program will unify three strands of research: networked learning, students’ conceptions of learning with technology, and architectural methods for the analysis and design of complex learning environments. It will create new, direct paths between the outcomes of research in the learning sciences and the tools used by people to create new learning opportunities for others. These emerging ‘teacher-designers’ will need the kinds of Computer-Aided Design tools now taken for granted in other design professions. Good design is the missing link between the learning sciences and the learning environments needed for success in the 21st century.

The fellowship program of work aims to:

1. Construct a coherent explanatory framework that can account for productive networked learning – understood as learning that involves people collaborating with the help of networked technologies in a shared enterprise of knowledge creation. This explanatory framework will take an architectural form, meaning that it will specify the structural relations between all the entities involved in productive networked learning, at a suitable level of abstraction for explaining how such structures achieve the functions necessary for learning to occur. Without such abstractions, every new tool or activity appears to be unique; the right abstractions can connect technological and pedagogical innovation.

2. Use this architectural framework to create and test improved methods and tools for the analysis and design of specific instances of productive networked learning. People involved in networked learning typically exercise considerable autonomy in making choices about the tasks they will tackle, the people with whom they will collaborate, and the tools and resources they will use. Effective design for networked learning needs to work with this autonomy; its methods help people co-configure their learning.

3. Show how to integrate information flowing from ongoing learning activities with research-based evidence about learning, in order to provide tailored, real-time, effective support and guidance directly to the people involved. This introduces a powerful new entity (software providing personalized learning advice) into the networked learning architecture. This turns out to have revolutionary implications for the processes and products of research on learning.
Approach

*Conceptual framework for the research program*

The conceptual framework integrates ideas and methods from:

i. architecturally-inspired analyses of the affordances of valued structures in the built environment, and the explanatory power of structural models that link form and function

ii. the analysis, from a learning sciences perspective, of technology-mediated, distributed activity systems; the goals, tasks, activities, outcomes, entities and relationships in networked learning

iii. empirical research studies of pedagogical thinking and design cognition.

A synthesis of (i) and (ii) will be used to create a coherent explanatory framework that can account for the important qualities of productive learning networks. This will allow us to put in place an integrated set of computer-based design tools and resources that align with the key constructs in this framework. The design tools and resources, and their underpinning ideas, will then be tested and refined through a series of experiments that focus on the work processes and achievements of teams of designers. The experiments will investigate important aspects of the relationship between the design constructs we provide and the thinking, language and other action of our designers.

Finally, the research program will draw upon methods from software engineering and Artificial Intelligence to model information flows between the heterogeneous components in the learning networks that we described above. This will identify requirements for the representation of evidence about effective learning, its use to interpret data flowing from ongoing learning activities, and to dynamically adjust the scaffolding, advice and other forms of support for learning.