



## **Creative Science: a new way of learning innovation and entrepreneurship?** **Ping Zheng & Vic Callaghan**

### **Educating entrepreneurs and innovators**

So where do we get the next generation of entrepreneurs and innovators to energise the UK economy? How successful are current educational methods in producing graduates with the necessary enterprise and innovation skills? For example, there is an increasing realization of the difficulties faced by graduates, with innovation-related jobs, in bridging the interface of technology and business. Technology development requires both tacit knowledge and practice, and therefore it is difficult to learn without ‘doing’. In the UK we are praised for the conservative culture. Has this culture somehow hindered our imagination and creativity that are critical for innovation? Should we consider integrating a futurist vision and the ‘science of imagination’ into an entrepreneurial learning approach or, as Julian Bleecker (a researcher at Nokia’s Design Strategic Projects Studio), put it, should we ‘look beyond the science of fact to achieve more than incremental forms of innovation’?

Innovation can sometimes be an elusive quality being dependent not just on skills or knowledge, but also on the potential for an inventor to imagine a new kind of service or product that does not currently exist. As the late James Hillman eloquently stated in his book *Healing Fiction* (p.111) “To be sane we must recognise our beliefs as fictions, and see through our hypotheses as fantasies.”

### **Creative Science - An innovation tool for entrepreneurs**

Nothing speaks louder to potential investors or customers than a prototype. All successful entrepreneurs have a vision of either a new product or way of doing business. Prototypes are the early evidence that such entrepreneurial visions have the potential to become real. Thus prototyping is a critical stage in feasibility development of a new product for entrepreneurs. Prototypes can take a number of forms from paper descriptions through to software or hardware emulations. In all of these, potential users are invited to exercise the prototypes in order to gauge the usefulness, usability, shortcomings or benefits of the ideas. A classic problem faced by a visionary entrepreneur is that his vision is ahead of his current implementation capabilities. So, in these circumstances, how can he create a convincing prototype that can be tested and presented to would be-partners or customers?

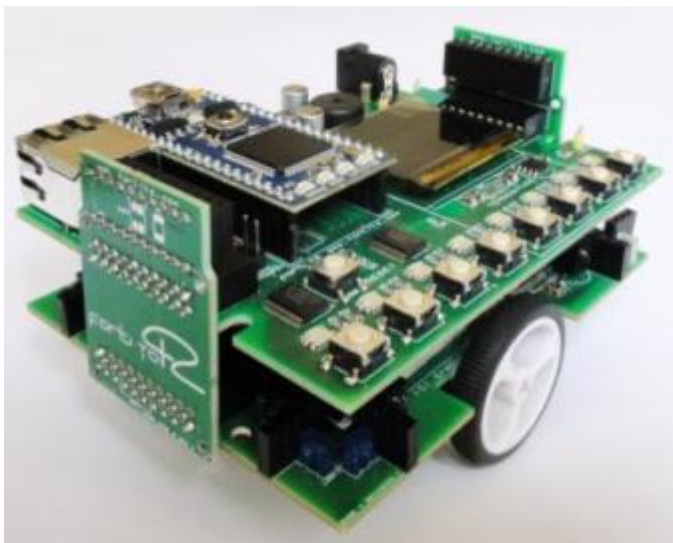
One answer is Sci-Fi Prototyping (SFP), a creative science methodology devised by Intel’s futurologist, Brian Johnson, in response to the innovation problems confronting Intel who were faced with designing the functionality of integrated circuits some 7-10 years ahead of their implementation. This was a particular problem for them, given that the product lifecycle

of the platforms they are targeting (eg mobile phones, computers) may only be 18-36 months, meaning Intel have to think three, or more, generations of market product ahead! Added to that, their principal resource, engineers, are trained to be methodological and structured thinkers rather than imagination driven designers.

The core methodology of SFP is the creation of prototypes in the form of science fiction stories that allow business professionals, scientists and engineers (or other groups) to invent new technologies or business mechanisms that can be sat in a wider social context for the explicit purpose of acting as prototypes for testing the ideas with potential customers, funders or developers. Its roots in imagination and play inspire and engage students and, the medium of stories (and creative arts), make the methodology accessible to everyone. Through the Creative Science Foundation (CSf) Intel are working with the authors to bring this methodology to entrepreneurial education and beyond ([www.creative-science.org](http://www.creative-science.org)).

### **Life, the Universe, and Everything**

How to revive the UK's financial fortunes may seem akin to the "ultimate question" posed in Douglas Adams "The Hitchhikers Guide to the Galaxy" in which the universe's most powerful computer (Deep Thought) was asked determine the meaning of "Life, the Universe, and Everything". In this article we argue the answer is better education of students in entrepreneurial skills and more accessible and engaging entrepreneurial tools. Earlier in this article we noted that technology development requires both tacit knowledge and practice, and should involve 'doing'. But, going beyond creating a story to implement a hands-on product, is a formidable challenge to the would-be technology entrepreneur.



**Figure 1. A Desktop Robot Assembled from FortiTo Modules**

In the "The Hitchhikers Guide to the Galaxy" the answer to the "ultimate question" turned out to be 42! Somewhat ironically, it may turn out that 42 is also an answer to making some product innovation tools available to students of technical entrepreneurship, as Essex University have spun-off a company called FortiTo Ltd (42 for short) that aims to provide a rapid prototyping system for their entrepreneurial students (see [www.fortito.com](http://www.fortito.com)). FortiTo produce a modular product building kit that allows a huge range of bespoke products to be assembled quickly. The particular approach taken by FortiTo is that 'plugging together', not just effects electrical connections (as in other products) but also shapes the products physical

structure (enhancing the fidelity of the prototyping), thus, for example they can be plugged together to produce a desktop robot (a favourite fodder of futurists), see figure 1. In a recursive twist to our story, the company was itself inspired by science fiction prototyping. The company is funded and managed according to the Faculty Cooperative principles, which means it is run by academics, for academics ([www.facultycooperative.org](http://www.facultycooperative.org)).

### Summary

Entrepreneurship is vital to the prosperity of UK economy and, we argue, there is a need for better educational tools to foster the passion and skills needed by students to become successful entrepreneurs. In this article we have examined support for technology-based entrepreneurship and introduced a methodology called Science-Fiction Prototyping (SFP), which we see as a philosophy to guide a new way of learning and a vision for production innovation. It leads our thinking to a 'science of imagination' but also it is possible that it enhances the entrepreneurship education by combining 'learning' and 'doing' that likely develop 'actionable' innovation skills of graduates. Given the UK is renowned for its creative arts industry (being, arguably, the largest cultural economy in the world relative to GDP) in our mind it makes sense for the UK to look at capitalizing on this by combining creativity, business and technology to ensure UK entrepreneurship is at the forefront of the world.

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