

BAM paper submission – 2023

Developmental Paper

The SME productivity gap: SME innovation – can an innovative pedagogy facilitating live innovation make any difference?

Track - Innovation track

Word Count - 2019

Claire Pattison – Senior Lecturer, Enterprise in Practice, SME Growth Lead

Chris Taylor – Senior Lecturer, Enterprise in Practice, NetZero Lead

Manchester Metropolitan University

Introduction

Given the unique position of the authors of this paper, academics delivering innovation programmes to small businesses, this paper offers an evidenced, practical insight into our approach to teaching innovation. Through an exploration of the pedagogy involved and a series of case studies with small business, this paper aims to compare live innovation teaching with courses that share tools and techniques to be applied a later stage. It covers the experiences across three innovation projects; SMART Cheshire, PrintCity Network and Eco-I NW.

This is an important and interesting topic, not least because for an SME (small to medium size enterprise), the route to successful innovation remains unclear. There is a problem with the application of theory into practical application for small businesses. The innovation projects delivered to SMEs directly address the issue that 50% of the regions SMEs are not innovating (Science and Innovation audit, 2018:6), a significant concern as SMEs are considered as central to economic growth (Singh et al, 2008).

This is a developmental paper and the authors hope it will lead to a full paper in the future.

Literature review

Innovation theory would benefit from further research, in academic terms it's a relatively new area of research and it has forked into three distinct categories: Resource, System and Process. The resource theory is inward looking and is rooted in the theories developed by Edith Penrose (1959), whilst the seminal theories of the Law of Diffusion of Innovation (Rogers, 1962) and Effectuation are concerned with the systems and process perspectives of innovation. The evolution of the three strands of theory mean that a practitioner must have an understanding of all three strands, yet key criticisms are that there are very few management tools to support the application of the theories (Arend et al, 2015). Therefore, it might be argued that there is a clear disconnect between the theory, and practical application. It has been suggested that research should try to improve the understanding and practice of managers (Van de Ven 2016) and the recurring question '*does theory inform practice? Or does practice inform theory?*' is one that interests the authors of this paper.

It is the view of the authors that research should have a practical application to advance the knowledge and capability of practitioners and to ensure this a new, pedagogical approach is

necessary. There is a gap in academic literature between resource, systems and process (the three categories), the application of research into practice, and the pedagogy.

A full literature review covering process, resource, systems and pedagogy will be undertaken for the full paper.

Context

The pedagogy and teaching methods explored in this paper, used in the classroom with small enterprises takes a new slant on design thinking, growth hacking, and innovation sprints, pedagogies that have been in use for a little while.

What's new with the pedagogy supporting live innovations;

- SMART Cheshire supports SMEs with live innovation, working on their live innovations during workshops, live testing the market with customers, evaluation experiments, hypothesis development and prototyping during the sessions. SMART Cheshire also ensures innovation readiness before the workshop series.
- PrintCity Network has developed a series of new management tools, in particular an innovation readiness tool.
- The Eco-Innovation team have repurposing existing tools to new applications, such as the ease/impact grid to support carbon reduction.

A key component is it is a repeatable process (as well as longitudinal) which actively encourage participants to re-use the innovation process, embed it within the business, for further product development (some companies launch several new products months later).

This is considered action and experiential learning, working with live business problems, issues and opportunities, however this form of workshop delivery goes further. The programmes are constructively aligned so the activity and work produced in each session is used in the next session. This feels unique to these innovation programmes as sister programmes teach the innovation process during the course, and the application of knowledge is taken at a later date.

Project process and data collection

All businesses accessing the support are required to register onto the programme. At this stage, productivity data is collected so that a baseline can be established. Once an enterprise has completed support then an output is collected via a conversation with a member of the project team. This evidences new to market and new to firm innovations, job increases and in the case of Eco-I NW, reductions in CO₂e, that are directly linked to the intervention of the project.

Case Studies of live innovation

1. SMART Cheshire innovation programme

The programme supports businesses to take an idea for a new product to prototype stage, through to launch. During the programme business owners will have a set of tools and techniques that will help implement live during the programme and new future ideas. Phase

one is a two-day launchpad to identify, analyse and optimise business ideas. Questions explored include: *Who is my customer? What problem is my business solving? Am I ready for the change adding 'something' new to my business could bring?* If the idea is innovation ready, the business owners progress to phase 2; the Challenge where they delve deeper into making ideas into a reality, building a digital roadmap with opportunity to enter phase 3 where selective businesses will receive technical assists to develop the idea even further.

By completion of the project, we expect to have supported 150 SMEs, and generated a minimum of 75 new to firm innovations and 40 new to market innovations.

The case:

We supported a business that use genuine parts from a Spitfire, that would otherwise go to waste, to make high quality watches. As an experienced watchmaker, he knew how to create the product – but he was missing crucial pieces of the puzzle. How much should it cost? What part of the story would appeal to customers? How can he raise awareness of the project?

“I had a rough idea of the design with no idea how I was going to do it or market it. There was the basis of a product, but I didn’t know how to take it forward.”

The programme helped the business realise that they weren’t just selling a watch, but selling the emotions that go along with the purchase. The business’s big break came after a promotional event was organised in October 2022. They invited the family members of the original pilots of this particular Spitfire and arranged for them to experience the restored aircraft in flight. The event made the third page of the Sunday Telegraph and, “that just exploded interest”. Within a year of launching the Spitfire watch, the business had made £500,000 worth of sales.

By completing the programme, they turned a major current live challenge into a real benefit for the business.

2. Eco-I NW

Eco-I NW is a project that supports SMEs to innovate to reduce the carbon impact of their activities and operations. It is delivered, primarily, through knowledge exchange workshops and has supported over 100 SMEs. The workshops cover:

- The science of climate change
- A self-assessment of each SMEs CO2e impact
- Impact evaluation and identification of opportunities for innovation
- Ideation of alternative solutions
- Development of a sustainability action plan with short, medium and long-term goals.

SMEs that identify a potential high impact, but high difficulty project that requires the support of a research institution can apply for 1-2-1 support to deliver a proof of concept plan for innovation. This can then lead to implementation of a significant innovation project, initiated by the Eco-I NW project.

By completion of the project, we expect to have generated a minimum of 31 new to firm innovations and reduced over 660 tonnes of CO₂e per year from the SMEs operations.

The case:

We supported a manufacturer of sport shoes who were looking to reduce the CO₂e impact of their operations. Through the support provided we were able to help them understand the processes and activities within the business that were causing the highest impacts, and which ones they have capacity to change and create an opportunity for innovation. Through the project it was identified that they produce, in China, 3,000 physical prototypes each year, which are then distributed to partners on four continents for feedback. This was recognised as a process within the business that could benefit from an alternative approach, potentially creating significant time and money efficiencies whilst saving 100s of tonnes of CO₂e each year. The business is currently being supported to develop a digital prototyping process to produce fully rendered 3D models which will replace the need for the 3,000 early-stage prototypes. This live innovation will almost certainly turn into a long-term collaboration.

3. PrintCity Network

The PrintCity Network project supports businesses to innovate and develop new products/services with digital manufacturing technologies. The project is delivered in two phases, the first being a series of knowledge exchange workshops and the second being 1-2-1 support for a specific innovation. Key content in phase one includes:

- An introduction to digital manufacturing technologies
- The principles of innovation and new product development including the theories of Effectuation (Sarasvathy, 2001) and the Law of Diffusion of Innovation (Rogers, 1962)
- Rapid prototyping
- Innovation readiness audit and action planning

SMEs that identify an opportunity for innovation can apply for 1-2-1 support where a specialist team provide support to develop a prototype which can then be taken to market. The project also gives SMEs access to industrial grade digital manufacturing equipment, including 3D printers, scanners and virtual reality technologies. By completion of the project, we expect to have supported 150 SMEs, and generated a minimum of 75 new to firm innovations and 38 new to market innovations.

The case:

We supported a museum based in Greater Manchester, that have a significant archive and were interested in exploring opportunities to create digital twins of their collection. During workshops, we experimented with an earthenware bottle, which was 3D-scanned using an Ein-Scan Structured Light 3D scanner with turntable. The 3D scanner produced a full-colour 3D model which was then replicated on our HP Multi Jet Fusion 580 Colour 3D printer. This small project showed the museum how an accurate replica can be archived and reproduced within 24 hours and proved the concept. It also gave them the idea that the technology could generate low-cost replicas that can be used for outreach activities with schools, creating a new avenue of engagement for the organisation. Phase two of the project then developed the concept further

and supported the business to formally adopt the technology and develop the capability to roll out the project in house.

Limitations

The delivery on all three projects will conclude in June 2023 and all outputs will be collected by September 2023. Therefore, a full analysis of the projects impact has not yet been possible. An exercise is underway to collect productivity data so that a before and after comparison can be made. Detailed outputs are also being collected from the businesses so that a causal link between the project support and the advancements made by the enterprise can be made. This will give both qualitative and quantitative data for analysis and present an opportunity to continue this research and draw more robust conclusions. However, this is still a tight period in which to conduct vigorous research and a longer period monitoring the impact would be highly beneficial.

Conclusions

We have argued that our programmes have moved the dial on SME productivity by following an innovation pedagogy by running workshops that facilitate live innovation, and this in turn has allowed the small businesses to launch new products and services to the market. At the time of writing the SMART Cheshire innovation programme, PCN and the Eco-I innovation programme has facilitated the release of at least 103 new products to market, and at least 218 innovations within firms. This outstrips the innovation programmes offered at the Centre for Enterprise that focus on theoretical innovation workshops with the application of knowledge taken to the workplace to happen once the programme has finished. The intention is to continue this research and develop this into a full paper.

References

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