Divide, Switch, Blend: exploring two hats for industry entrepreneurship and academic practice-based textile design research

Cathryn Hall & Rebecca Earley

Published online: 31 May 2019.

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Divide, Switch, Blend. Exploring two hats for industry entrepreneurship and academic practice-based textile design research

Cathryn Hall[a]*, Rebecca Earley[a]

[a]Centre for Circular Design, University of the Arts London
Corresponding author email: *cathryn.hall@arts.ac.uk

Abstract: This paper explores different approaches taken when 'wearing two hats'; that of academic researcher and the industry entrepreneur. It considers the barriers and opportunities in combining these two roles in order to acquire new knowledge. To understand how future researchers could best do this and why this might be desirable, the paper presents Author1's insights from field research experience; wearing both hats within a textile industry context. A literature review, reflective practice and an annotated portfolio method enabled the authors to identify three approaches – *Divide, Switch* and *Blend.* These form a model for researching with any two hats on: *Divide* entails wearing both hats separately on different occasions; *Switch* is wearing both hats but interchanging between the two on a single occasion; *Blend* is wearing both hats simultaneously. The authors conclude that fluidity between approaches and an understanding of the dominant hat is vital.

Keywords: Academic Research, Entrepreneurship, Dual Roles, Textile Design, Two Hats

1. Introduction

Design researchers working with sustainability need to make their research impactful, useful and relevant. Within design research the experience of the individual is a vital consideration (Rogoff, 1995). However, while of value in itself, the subjective component (in this case, the author's additional role as entrepreneur) can cloud research insights.

The paper outlines the tensions and opportunities of combining these two roles, or 'two hats', in three distinctive ways – dividing, switching and blending – in situations, as required. Using personal reflective practice (Schön, 1983) formalising the findings into a table, and finally visualised (Tufte, 2001) through a model as a method of drawing out further insights. Although this paper focuses on one such experience to develop the proposed three ways, other insights from field work with the Author1 PhD research was drawn upon. This has provided a preliminary model for researchers, within and outside of textile design, when wearing any two given hats.

This paper focuses on the experiences of Author1's PhD research in which she wore the hat of an academic textile design researcher and the hat of the textile industry entrepreneur. Author2

provided the original idea for the paper and supported Author1 with the reflection, mapping, structuring, editing and refocus/review processes. Author2 is also a researcher and entrepreneur in the same design field, with significant experience of inhabiting both hats.

The paper is split into two parts. Part 1, *Making the hats*, develops an understanding of the terrain through a short literature and practice review on research that combines research and industry stakeholders. Part 2, *Wearing the hats*, presents an example of Author1's personal experience in the field in which she wore both academic researcher and industry entrepreneur hats within textile design research. Established methods of reflective practice are used here - specifically in textile design – and are applied to provide insights for future entrepreneurial research. The findings present the three approaches for the adoption of the two hats - *divide, switch* and *blend* - to produce a fluid model for combined practice. Finally, special consideration is given to recognising the 'dominant hat' in any given context as a means of maximising insights from both perspectives.

2. Methods

The paper was developed by fusing three key methodological approaches - literature review, case study and reflected practice – in order to formulate the final model.

A short literature review forms the foundation of the first part of the paper. This first of all looks outside of the field of design to explore parallels with other disciplines where academic research and professional practice are combined. This is followed by a review of design research and literature where knowledge from academia and industry are combined.

The second part of the paper is a personal reflection based on field work conducted by Author1 where the hats of both textile design researcher and textile design entrepreneur were worn. For the purposes of this paper only one field experience is discussed; however, Author1 was able to draw upon other, previously completed research tasks. For the clarity of this research paper, the best example has been discussed.

Reflective practice methods (Schön, 1983; Igoe, 2013) enable the incorporation of personal experience (Clandinin and Connelly, 1994) and reflection on experience to enhance learning (Boud, Keogh and Walker, 1985). The project between Author1 and the industry partner discussed in the paper uses a field research methodology (Burgess, 1982) including observation, conversation and documentary evidencing. These were amalgamated with 'designerly ways' (Cross, 2007) and tacit design knowledge (Polanyi, 1958) to generate qualitative data.

Data analysis was achieved using an adapted annotated portfolio method (Gaver and Bowers, 2012; Sauerwein, Bakker and Balkenende, 2018) applying field notes and thick description (Lincoln and Guba, 1985) to photographic documentation (Figure 1). The annotations were then colour coded to establish similarities and differences between the hats. This enabled patterns and insights to be gathered in the form of two tables. Firstly, a table was generated to establish a clear view of when Author1 believed which hat was being worn at which time. Secondly, a table was constructed to form an analysis to establish and refine the three approaches considering the relative strengths and weaknesses put forward by Unluer (2012) as necessary to insider research. Finally, in order to extend understanding of the three approaches, visualisation methods (Tufte, 2001) in the form of a model were employed. It was through the construction of these models that analysis took place to draw out new insights identifying the importance of a dominant hat.

TIMELINE

ENTREPRENEUR

ACADEMIC

COST EXERCISE &
IMPACT ON PRODUCT
 - PULLED
- PULLED + CARDED
- PULLED + DOUBLE CARDED

UNDERSTAND THE POTENTIAL
PROCESS STEPS
- PULLED
- PULLED + CARDED
- PULLED + DOUBLE CARDED

NEW MACHINE
WHAT DOES THE PRODUCT LOOK
& FEEL LIKE NOW?
DOES THIS HAVE AN EFFECT?

UNDERSTAND THE REALITIES OF
WORKING WITH INDUSTRY
BROKEN MACHINE
COSTING £X? TO REPLACE
(NOT WORTH IT)

WHITE
TRIAL TO SEE POTENTIAL
ISSUES WITH CONTAMINATION
- BLACK LABELS
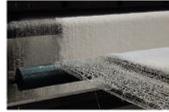
WHITE
TRIAL TO SEE POTENTIAL
ISSUES WITH CONTAMINATION
- BLACK LABELS

WASTE
COULD I DESIGN SOMETHING WITH THIS?
WHAT HAPPENS TO IT?
COULD THIS BE PART OF THE
PRODUCTS STORY?

WASTE
HOW THIS FITS INTO THE SYSTEM?
COULD I DESIGN SOMETHING WITH THIS?

PROBLEMS
WHAT ARE THE ISSUES WITH PRODUCTION?
HOW CAN THESE BE SOLVED?
DOES THIS NEED AMENDING FOR THE
PRODUCTS I DESIGN?

REALITIES
THE BOUNDARIES OF PRODUCTION
IF I WANTED IT REALLY THIN OR THICK
WHAT IS ACTUALLY POSSIBLE WITHIN
THIS PROCESS
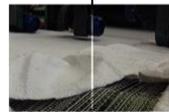
SPEC
WHAT HAS BEEN MADE?
DOES IT NEED TO BE ADJUSTED?
HOW MUCH MATERIAL IS PRODUCED?
WHAT IS THE WASTAGE % (BALL PARK)?
HOW MUCH WILL IT COST?

SPEC
IS THIS REALISTIC IN TERMS OF COST
AND PRODUCTION, IS IT WORTH
INVESTIGATING FOR RESEARCH

DESIGN
WHAT CAN I DESIGN WITH THIS?
CAN IT BE USED COMMERCIALLY?
WHAT WILL BE SUITABLE?

DESIGN
WHAT CAN BE DESIGNED WITH THIS?
WHAT SYSTEM WOULD THIS FIT INTO?
IS THERE A BUSINESS MODEL THAT COULD WORK WITH
THIS MATERIAL?

Figure 1. Annotated portfolio method from the trial

3. Context: Understanding the Hats

Researching within an industry setting uses similar methods to researching within an academic institution but with different goals and objectives. Asking similar questions, the academics' interest is situated in the 'know-why' and the industry's in the 'know-how' (Mujumdar, 2004). The following section follows the relationship between university and entrepreneur (3.1), the literature surrounding blending research with entrepreneurship (3.2), the position of insider research (3.3) and industry experience in relation to academic research (3.4). Finally, contemporary context within sustainable and circular design where this approach is increasingly being used (3.5).

3.1   The Relationship between University and Industry

The relationship between universities and industry has shifted in recent years from 'arm's length' to closer contact with particular focus on the science and technology disciplines (Schutze, 2000). Littered with debate about conflict of interest, withholding publishing and compromises, the relationships between the two sectors can be very problematic (ibid). Innovation policy drivers are focused on increasing university commercialisation potential by the creation of university spin-out companies (Fowler, 2017). Referred to as the triple helix, Etzkowitz and Leydesdorff, (1995) have explored the contribution of *university-industry-government* and how the interactions of all three have changed over time, altering dynamics, pushing universities away from the traditional model to contributing to industrial activity.

Ever-increasing pressure placed on universities to obtain funding and resources has paved the way for development of entrepreneurial researchers to make new spaces for their research. EU funding is tied to collaborative networks between academic institutions and industry; these types of research projects are perceived as desirable with higher prospects of obtaining external funding (Mønsted and Hansson, 2010). Focusing more specifically on design research the recent push towards industrial collaboration is shown by the Arts and Humanities Research Council AHRC (2018) partnership with Innovate UK to pursue "knowledge transfer partnerships" helping industry access the expertise from UK Universities.

3.2   The Researcher Entrepreneur

To understand the challenges of donning both research and entrepreneurial hats, it is necessary to look outside the field of textiles, and further still outside of design. Disciplines such as the sciences and healthcare offer a greater scope of experience to learn and benefit from.

The concept of researcher and entrepreneur is one that divides opinion. Within the discipline of science, where traditionally the realms of research and commercialisation were kept separate, scientists are now more open to bridge this gap, some creating their own firms to benefit from their academic discoveries (Etzkowitz, 1983). This has also lead to the rise of Clark's (1998) concept of the 'entrepreneurial university' by which institutions can create revenue from the academic work they produce. The varied interactions between university and industry such as consultancy and contract research, joint research, or training has grown and in these ways researchers are now interacting, rather than following traditional routes such as patents and spins offs (D'Este and Patel, 2007).

The role of the researcher has adapted in which a new hybrid role of scientist/entrepreneur has emerged. This hybrid role identity allows the researcher to split themselves into the academic self and the commercial persona (Jain, George and Maltarich, 2009). This concept has been further developed by Lam (2010) describing scientists fitting into one of four category types:

- Type I 'Traditional Scientists': Boundary Separation and Expulsion

- Type II 'Traditional Hybrids': Boundary Testing and Maintenance
- Type III 'Entrepreneurial Hybrids': Boundary Negotiation and Expansion
- Type IV 'Entrepreneurial Scientists': Boundary Inclusion and Fusion

At either end of the spectrum we can see the extremes of opinion. Type I (traditional) scientists believe that research and industry should remain completely separate. They think that those attempting to bridge this gap would be more suited to research and development in large corporations and any industry involvement in academia would undermine the research objectives. In contrast, Type IV (entrepreneurial) scientists demonstrate the full integration of both roles, accepting the boundaries as completely flexible and sometimes entirely merged. These scientists were able to wear both hats simultaneously and saw the benefits of the two sides combining in which both roles influenced and benefited each other (Lam, 2010).

The concept of creating a hybrid between practice (or entrepreneurship) and research is not new. Clinical research, in the field of surgery, has been regarded as the 'golden key' for developing techniques and understanding in the field. However, combining the 'two faces' of surgical practice and research is described by Huber-Lang and Neugebauer (2011) as 'squaring the circle' which they point out in reality is very difficult without a set of pre-requisites and could be potentially undesirable. In contrast, Fleet *et al.* (2016) argues in the field of counselling the adoption of both roles (councillor and researcher) can be used for the benefit of the investigation. There is, however, challenges when using a dual role approach, such as ethical considerations and bias. Kitchener (1988) argues against dual roles within this domain as the relationship blurs the power and obligation leading to altered expectations with potential negative consequences.

3.3 Insider Research

The concept of the dual role, or wearing 'both hats', often appears in literature as 'insider research'. According to Brannick and Coghlan (2007) the value of this approach within organisational research demonstrates no inherent reasons for this style to pose an issue. Bonner and Tolhurst (2002) identified fundamental advantages for an insider researcher having greater understanding of a situation, allowing for easier communication and better judgment of accuracy. An insider understands how things works in reality and has a great depth of knowledge which might take an outsider much longer to develop (Smyth and Holian, 2008). However, this it is not without disadvantages; often balancing the roles is difficult, unconscious biases and other difficulties are common (Hewitt-Taylor, 2002, Mercer, 2007). In contrast 'the stranger' could more easily critically observe events and situations (Schuetz, 1944). It is by understanding both the challenges and opportunities that the insider research can best succeed (Unluer, 2012, Saidin and Yaacob, 2016, Mercer, 2007).

3.4 Research and Industry experience

Experience of industry as a method to inform research is another way both hats could be worn. The hospitality discipline emphasises industry experience as a central part of the subject. It was raised by Phelan, Mejia and Hertzman (2013) that within the US hospitality faculty, almost half of academic experts will retire by 2023 and the younger successors have notably less industry experience. This has led to as an 'industry-experience gap' or 'theory-practice gap' and has been regarded as an issue within education sector. The importance of finding solutions to connect theory with practice is discussed across the literature (Govender and Taylor, 2015, Cheng, Cheng and Tang, 2010).

Studies also point towards collaboration between academia and industry as a way to form deeper insights into real industrial problems (Bhullar, Nangia and Batish, 2017). Tijssen, Lamers and Yegros

(2017) introduce the concept of university-industry crossover researchers, who combine one or more university affiliation and business affiliation in recent years. This can also be referred to as industry turned academic (Santoro and Snead, 2013, Puia *et al.*, 2000). Yet, as Hofbauer (2008) points out in the case of scientists moving between the realms of academia and research, individuals need a high degree of flexibility to do this.

3.5   Design and Industry

Across the field of design there is a wealth of examples as disciplines within the research field are increasingly collaborating with industry. For example, small-scale academic projects creating a knowledge transfer with industry, including jewellery design (Penfold, 2007) and product design (Crabbe, 2008). Using these methods ensures lessons can be learnt and publicly communicated (ibid). Other approaches have been displayed using industry workshops to develop new research ideas and testing academic thinking by exploiting real experience and expertise of the participants (Earley, 2017). Sustainable textile research conducted with industry, through sampling at PhD level has resulted in useful models over the years (e.g. Farrer, 2000; Goldsworthy, 2012; Paine, 2015).

More recently, as the framework of the circular economy as a connected system has been brought to the fore from organisations such as the Ellen MacArthur Foundation, designers are now being asked to look across the whole lifecycle and consider business models, services and systems (Ræbild and Bang, 2017). Emphasised by the circular focus areas of the European Commission Horizon 2020 funding, this is a good example of where this collaborative approach between research and industry is needed.

Examples such as the Trash-2-Cash (2018) project which developed a design-driven material innovation methodology to work with 18 partners academic and business. Similarly, the FIBRESORT project, led by Dutch social enterprise Circle Economy (2018), is working to foster academic insights from industry by collaborating with industrial partners to create a rich environment for insights from both sides. Other examples include Sweden-based Mistra Future Fashion (2018) an interdisciplinary research project working with industry to ensure insights produced are useful and relevant for the industry it wishes to help transform. The research is split into four themes, in which the design theme worked closely on a project with fashion brand Filippa K, to develop and translate research ideas into a commercial context (Disrupting Patterns, 2018). Finally, a very recent research grant scheme from AHRC, Creative Clusters (2018) awarded academic researchers funds to work directly with creative industry partners. Each 'cluster' is hosted by a higher education institution with full involvement of industry, from the research and development, to strategy and governance.

4. Field Research: Wearing the Hats

4.1   Context

Anneka Textiles is a start-up business established by Author1 in October 2016. The business recycles post-consumer waste knitwear, using a mechanical recycling method, to produce materials for small ranges of luxury interior products. In addition, Author1 is also a PhD research student at the Centre for Circular Design (CCD) undertaking a practice-led PhD on the subject of post-consumer textile recycling, specifically focusing on mechanical technology.

4.2   The Field Research

The research took place in September 2018, with a recycling company who use a traditional needle felting technique to produce a recycled felt. Henceforth this business will be referred to as the 'Recycling Company'. Author1 had been in contact and worked with the recycling company multiple times, but in this particular instance Author1 was wearing both hats; PhD researcher (referred to from now as the 'researcher') and Anneka Textiles entrepreneur business owner (referred to from now as the 'entrepreneur'). It was in adopting both roles and through self-reflective analysis that the challenges and opportunities could be understood. These will be discussed later in section 5.

The purpose of the visit was to trial recycling equipment. To explain this efficiently a simplified diagram adapted from WRAP (2012) has been produced, which demonstrates the process for the recycling of textiles. (Figure 2)
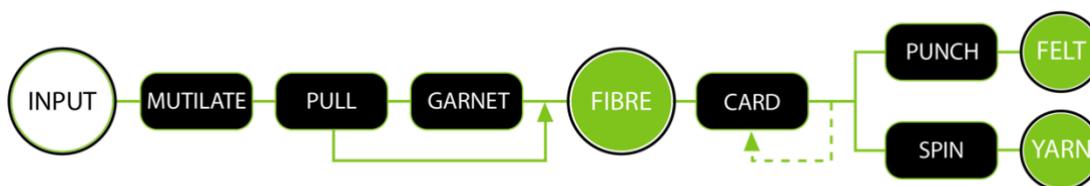

Figure 2. Simplified process of recycling textile, adapted from WRAP (2012)

Pulling is the first stage of returning textiles to fibre, 'opening' or 'pulling' the textiles back to a fibrous state. The result of this first rudimentary stage is fibre and remnants of textile material. Garneting is similar but understood as a more specialised stage ensuring threads are transformed to fully fibrous form (Gee, 1950).

It was when the entrepreneur costed each stage of the process from input to material (Figure 2), garnetting was highlighted as a particularly expensive stage. This increased the material unit price and therefore negatively affected the profit margin of products designed with the material. As with many start-up businesses, limited funding for the development of new materials necessitated searching for solutions to reduce costs.

During a meeting with the recycling company Author1 was made aware they might offer a solution by duplicating the carding stage and thereby avoiding garnetting. A trial was organised to establish:

a)   If the pulling machine could successful be used on clothing
b)   If after a single card the fibre could be used to produce felt
c)   If double carding might improve the fibre to achieve a similar effect to garneting.

200kg of white knitwear was obtained for the trial. White was selected as an additional investigation into the impacts of contamination from oily machinery and other coloured fibres. The hypothesis was that white would easily show any colour or dirt picked up through the processing.

Author1 had previously developed a relationship with the 'manager' and 'director' of the recycling company, as an entrepreneur. The relationship was instrumental for the recycling company to work with her as *both* researcher and entrepreneur. It was this relationship, in combination with the company's interest in new product avenues for their processes – an interest in new recycling methods, as well as an awareness for the need to adapt their business model for a future sustainability - which permitted the trials to take place.

The focus of this paper will be on the two roles - researcher and entrepreneur - during the described trial. It will establish how the author balanced the two roles as both an opportunity and a barrier. Physical results of the trial will only be referenced to in relation to Author1 taking on two roles and not discussed in full.

5. Discussion

'Wearing two hats' within a single experience can be complicated. The aim of this research paper is to determine the key approaches of taking on dual roles from a personal reflective experience of Author1's design research and design entrepreneurship. The collaboration between researchers and industry particularly in a design context can be tenuous, critical and often an undisclosed dynamic relationship which needs to be addressed. It is the objective of this paper to understand the areas of tension and opportunity derived from wearing *two* hats within the context of design.

5.1 Two Hats

Table 1 (see below) was created through a personal reflection on the field research as described and shows the main topics of investigation. The crosses marked visualise how the interests of the researcher and the entrepreneur aligned and divided established by Author1 personal understanding of how she split herself between the two roles. It was concluded in this case, that the researcher was predominantly concerned with the overarching system in which textiles can be recycled and waste may occur. In contrast the entrepreneur's priority was to understand the cost and design implications of the process.

5.2 Attitudes of the hat wearer

Table 1. Crossover in investigation between 'researcher' and 'entrepreneur'

TOPIC OF INVESTIGATION	ENTREPRENEUR	RESEARCH
COST EXERSISE	X	
TRIAL IMPPLICATION ON FINAL MATERIAL	X	X
IMPLICATION OF ADAPTING PROCESS		X
BROKEN MACHINE - IMPACT OF THIS ON THE MATERIAL	X	
REALITIES OF WORKING WITH INDUSTRY	X	X
CONTAMINATION ISSUES	X	X
WASTES OF THE PROCESS	X	X
UNDERSTAND THE CURRENT SYSTEMS IN PLACE FOR THE WASTE		X
COULD THE WASTE BE DESIGNED INTO SOMETHING?	X	
COULD THIS BE PART OF THE 'STORY' (MARKETING)?	X	
UNDERSTAND THE ISSUES WITH PRODUCTION	X	X
BOUNDRIES OF PRODUCTION		X
UNDERSTAND THE SPEC	X	X
DOES IT NEED TO BE ADJUSTED FOR FINAL PRODUCT	X	
HOW MUCH CAN BE PRODUCED?	X	
WHAT IS THE WASTAGE?	X	
HOW MUCH WILL IT COST?	X	
IS IT REALISTIC METHOD?		X
POTENTIAL PRODUCTS THAT COULD BE DESIGNED	X	X
COULD THIS FIT INTO A FUTURE MODEL FOR RECYCLING?		X
ARE THER FUTURE BUSINESS MODLES THAT WOULD WORK WITH THE MATERIALS?		X

The attitudes of both hats differ and ultimately influence each other as a benefit and a hindrance. This is demonstrated by the crossover or separation of investigation interests (see Table 1). On refection, if the researcher hat had been worn alone the visit might have lasted longer, insuring

every part of the process had been witnessed and discussed. The entrepreneur main attention was to ensure the material could be successfully produced and then reflect on the outcomes afterwards with testing and experimentation. This attitude of the entrepreneur, avoiding split decisions and experimenting afterwards, has its advantages for the development of product. Yet, the researcher's requirement to be thorough during the investigation is also valid. It is therefore vital to establish the tensions that might occur between the two roles.

5.3 Differing hat agendas

By studying the patterns which have come out of Table 1 we can see that the entrepreneur is nearly always concerned with the enquiries of the researcher, with only a few exceptions. On closer inspection the exceptions are 'future' based lines of investigation. This has been illustrated in Figure 3 by a 'now, near, far' context (Goldsworthy, 2012). The entrepreneur is firmly situated in the 'now' and will consider the 'near'. In contrast, the researcher is future-focused situated in both 'near' and 'far'.

Figure 3. Illustration of the areas of interest for each role (Researcher/Entrepreneur)

These opposing views create opportunity for both hats to consider the opposing agenda. For example, the researcher without the entrepreneur would have continued to use the garneting method, therefore not considering other options for a future system. Cost, in this case, not considered by the researcher, was highlighted by the entrepreneur and demonstrated the realities of the industry for the researcher hat. Then again, a relentless focus of costs could limit the scope of the research. It is therefore vital to courteously navigate both hats and their agendas. This can be challenging, but by spanning agendas across 'now, near and far' provides a multifaceted and rounded approach.

6. Approaches

Throughout the case study the hats of both researcher and entrepreneur were used differently as the situation demanded. Both hats were constantly being exchanged, at points it became difficult to establish which hat was being worn at which moment and juggling between the two blurred the lines. Yet, the demands of both roles did align, and an understanding was reached to satisfy both sides meaning they could be worn simultaneously. This has shaped the development of the three approaches outlined in Table 2. Opportunities and barriers to each approach has also been reflected.

Table 2. Three approaches and barriers/opportunities of wearing two hats (researcher/entrepreneur)

APPROACH	DEFINITION	BARRIERS	OPPORTUNITIES
DIVIDE	Wearing both hats separately on different occasions	**Unrealistic:** If this approach was used every circumstance	**Experience:** Individual gains the experience of both hats but not at the same time
		Inflexible: Hindering the experience of both hats from influencing one another	**Simplified:** Less complicated approach, could lead to less issues
SWITCH	Wearing both hats but interchanging between the two on a single occasion	**Disregard:** By wearing one hat and not another could lead to missed opportunities	**Informing:** Interchanging between hats can use each role to inform the other
		Confusion: There could be a struggle to understand which hat is being worn and what this means.	**Balance:** This approach is balanced between each role
BLEND	Wearing both hats simultaneously	**Conflict:** Could lead to conflict between the two roles	**New perspective:** Considering both roles at the same time creates a new perspective
		Blurred: Could be unclear what the results mean to each role	**Balance:** This approach is balanced between each role

6.1 Divide

Divide is the most unencumbered of the three approaches. This was demonstrated prior to the investigation when the entrepreneurial hat was exclusively worn, establishing the potential to omit the garnetting stage. It was only at a later date, once the trial had been arranged, that the researcher hat was put on requesting to witness the process. Although this is a very tidy way to compartmentalise spitting the roles, it is unrealistic for every situation in a complex world. For example, the entrepreneur in this instance is assumed to have no interest in being present at the trial. However, in practice being in attendance benefited the entrepreneur creating the opportunity for deeper understanding and implications of the processes.

6.2 Switch

The rigidity of divide, it can be argued, is combated by the switch approach offering more flexibility. Switching between the hats, often quickly and frequently can be used to satisfy both hats priorities. For example, when considering the issues of waste, a line of investigation lead by the researcher hat and also of interest to the entrepreneur. Conversation was led by the manager about this issue meant the two hats were constantly switched dependent on the information given. The flexibility of changing between hats benefited this style of research. Often a single line of enquiry for one hat, for example made by the entrepreneur, would then lead to important insight for the other hat, the researcher.

However, this approach is not without its challenges. Switching between hats was found to be challenging. Determining which hat was being worn at which point led to confusion subsequently meaning more detailed reflection needed to be completed to separate the insights for each side. Additionally, when the researcher arrived at the recycling company, miscommunication meant the pulling stage had already been completed. It was in this moment that the hat was switched. The entrepreneur was excited to see the following stages (carding and needle punching) and as pulling had been successful, the researcher hat was discarded, and no questions were initiated. Retrospectively, this was an opportunity missed and questions could have provided greater insights for the researcher.

Switching hats was found to not always be a conscious decision but executed by external parties. For example, although the recycling company were informed that both hats are being worn their alliance was with the entrepreneur. This was due to her potential to provide business for them. They were

happy to help the researcher and answer any of her questions. Yet, the realities of business and what is practical often forced hats to be changed during conversation.

6.3 Blend

Blend is a nuanced approach in which the entrepreneurial and research aspects are treated holistically. Each hat influences the other to provide insights, without the conflict and continuous switching between them. Yet, this is not without its challenges. The distinction between the hats being worn can be blurred causing the wearer to misunderstand insights. For example, the below illustrations of blending the hats by Author1, was not understood at the time but by reflection afterwards.

Contamination of colour and dirt, for the entrepreneur, are two of the biggest barriers for commercial product development. This also interested the researcher as a barrier for the system and therefore the two hats were aligned. Both hats were interested in the results of using a white input to maximise evidence of contamination. For both, there was an element of concern in the design challenge of working with, what was considered, a difficult colour for product design. This was heighted by the challenge of working around the contamination which appeared. Blending the two hats concerns over a single issue threw up challenges and insights as each side influenced the other to generate ideas and solutions.

Furthermore, it was brought to the attention of the entrepreneur that a new needle punching machine was being used was different to that of a previous trial. This meant an altered method was employed to produce the felt, which for both the entrepreneur and researcher, could dramatically impact the appearance and function of the material. This situation provided an opportunity to understand the adaptability of the entrepreneur – for both the entrepreneur herself and for the researcher hat. The researcher could reflect on the entrepreneurial role and the real challenges faced when working in the industry. In doing this meant both hats were being worn together, blending the two sides for the benefit of each.

6.4 Fluidity

Understanding the three approaches, along with the barriers and opportunities, is crucial to successfully wearing both hats. By reflecting on the field research, it was found that a mix of approaches 'switch' and 'blend' were adopted by Author1. In addition, the 'divide' approach was used prior to the trial. By reflecting on this experience and considering all three approaches it was found that the boundaries between the three were often blurred. Therefore, to effectively wear both hats a combination of *divide, switch* and *blend* is required dependent on the situation. This has been visualised in a triangulation model (Heale and Forbes, 2013), accepting all three methods can be interchanged fluidly (Figure 4). This enables the greatest potential to overcome the listed barriers and exploit the opportunities of each approach.
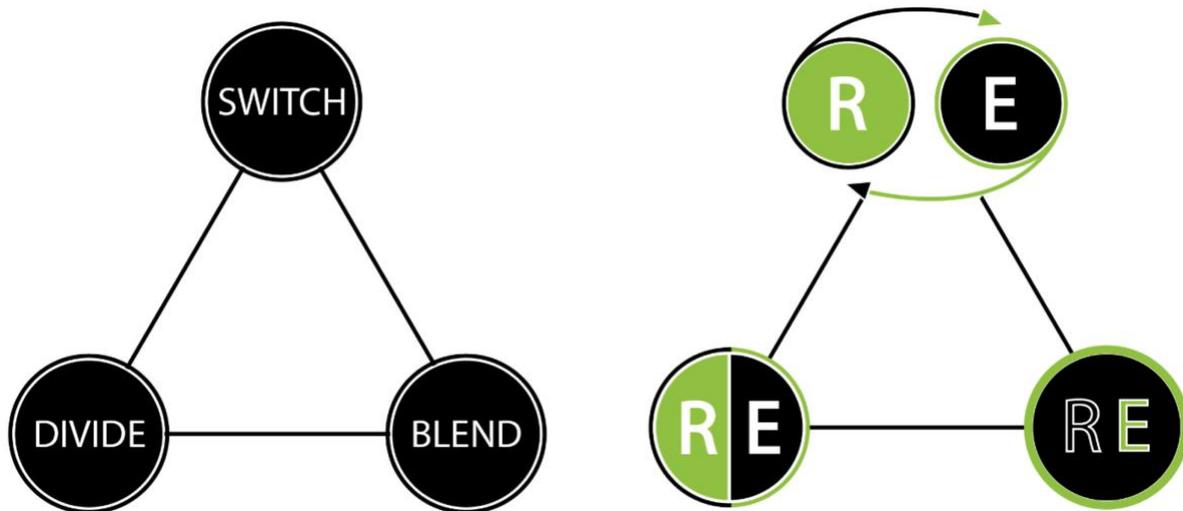
Figure 4. Triangulation model between dual role approaches (Researcher and Entrepreneur)

6.5 Dominance

By understanding the reasons for a fluid interchange of approaches is key for the individual to identify insights. It was found by analysing the experience of Author1 that there was always a 'dominant' hat within any given situation (Figure 5).
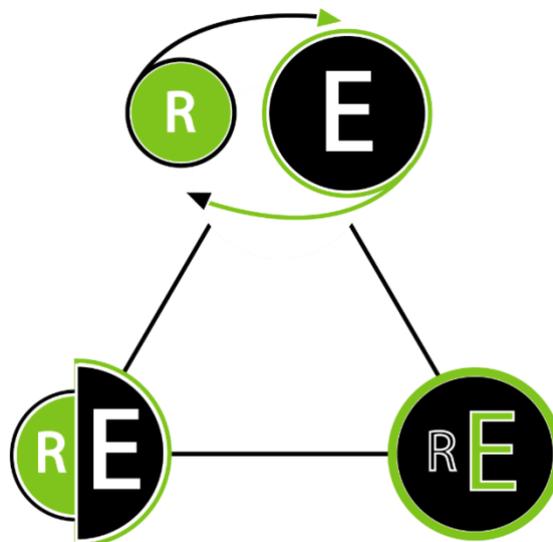

Figure 5. Triangulation model detail emphasizing the dominant hat

This was demonstrated by the developed relationship with the recycling company over two years prior to the trial. It was important to both researcher and entrepreneur to sustain this professional relationship. This involved small talk as well as personal conversations, whilst the industrial processes ran their course. This relationship permitted questioning and deeper understanding of the process, leading to discussion about other design projects the recycling company had worked on. The entrepreneur was interested in other design examples, but it was the researcher hat which was brought to the fore to understand the different end products and how these might fit into a larger

system. This illustrates a complex situation in which both hats were being worn together with one becoming more dominant than the other.

The concept of the dominant hat can easily be applied to both *switch* and *divide.* When using both these approaches the hat in play is clearly understood as dominant. This becomes more complex when the *blend* approach is used. In this case, each hat influences the other and it is the fight for dominance that provides the most valuable insights. It is concluded that the domination or submission of a particular hat can force a change in approach. Therefore, the ability to fluidly change is the key to successfully wear two hats, driven by the power play between the sides.

7. Conclusion

This paper firstly looked outside of the design field, to complete a concise literature review establishing the terrain of the topic. This led to deeper understanding which the authors used to help them reflect on the field research study. This paper has provided a model from within the context of design for the adoption of dual roles - referred to as two hats - within an academic research and entrepreneurial context. Although from the design discipline, this could be adapted for use within any field when wearing two different hats. Through reflection of Author1's personal experience three approaches were produced - *divide*, *switch* and *blend* - as a method to wear both hats effectively. *Divide* entails wearing both hats separately on different occasions; *Switch* is wearing both hats but interchanging between the two on a single occasion; *Blend* is wearing both hats simultaneously.

The findings demonstrate that each approach can be adopted successfully by optimising the opportunities and overcoming the barriers in a given situation. It is the depth of understanding of these barriers and opportunities which allows the individual to use each approach effectively. Furthermore, to fully benefit from all three approaches it has been concluded that fluidity was fundamental to the success of wearing both hats. The ability to alternate, as each situation demands, is advocated as the key method to overcome the barriers of each - *divide, switch* and *blend*. Finally, by understanding the power-play of the *dominant hat* across the three approaches, the authors were able to understand how *fluidity* of hat-changing can successfully lead to obtaining broader insights.

This paper has limitations. The model might benefit from other field research across different contexts to broaden the results. Using a personal reflective method was determined as appropriate means to consider this topic and develop a model; further research to develop this model would benefit from contributions across the disciplines in this under-researched area.

References

AHRC (2018) *Innovation - Arts and Humanities Research Council*. Available at: https://ahrc.ukri.org/innovation/ (Accessed: 7 November 2018).

Bhullar, S. S., Nangia, V. K. and Batish, A. (2017) 'Channels of interaction and past collaborative experience as imperatives in academia–industry collaboration', *Technology Analysis & Strategic Management*, 29(10), pp. 1210–1224. doi: 10.1080/09537325.2016.1277694.

Bonner, A. and Tolhurst, G. (2002) 'Insider-outsider perspectives of participant observation', *Nurse researcher*, 9(4), pp. 7–19.

Boud, D., Keogh, R. and Walker, D. (eds) (1985) *Reflection: turning experience into learning*. London: Kogan.

Brannick, T. and Coghlan, D. (2007) 'In Defense of Being "Native": The Case for Insider Academic Research', *Organizational Research Methods*, 10(1), pp. 59–74. doi: 10.1177/1094428106289253.

Burgess, R. G. (ed.) (1982) *Field research: a sourcebook and field manual*. London: Unwin Hyman (Contemporary social research series, 4).

Cheng, M. M. H., Cheng, A. Y. N. and Tang, S. Y. F. (2010) 'Closing the gap between the theory and practice of teaching: implications for teacher education programmes in Hong Kong', *Journal of Education for Teaching*, 36(1), pp. 91–104. doi: 10.1080/02607470903462222.

Circle Economy (2018) *Circle Economy – practical, scalable implementation of the circular economy*. Available at: https://www.circle-economy.com/ (Accessed: 21 November 2018).

Clandinin, D. J. and Connelly, F. M. (1994) 'Personal experience methods', in *Handbook of qualitative research*. Thousand Oaks, CA, US: Sage Publications, Inc, pp. 413–427.

Clark, B. R. (1998) 'The entrepreneurial university: Demand and response [1]', *Tertiary Education and Management*, 4(1), pp. 5–16. doi: 10.1080/13583883.1998.9966941.

Crabbe, A. (2008) 'The Value of Knowledge Transfer Collaborations to Design Academics', *The Design Journal*, 11(1), pp. 9–28. doi: 10.2752/175630608X317887.

Creative Clusters (2018) *Creative Industries Clusters Programme*, *AHRC Creative Economy Programme*. Available at: https://ceprogramme.com/cicp (Accessed: 21 November 2018).

Cross, N. (2007) *Designerly ways of knowing*. Basel: Birkhäuser.

D'Este, P. and Patel, P. (2007) 'University–industry linkages in the UK: What are the factors underlying the variety of interactions with industry?', *Research Policy*, 36(9), pp. 1295–1313. doi: 10.1016/j.respol.2007.05.002.

Disrupting Patterns (2018) 'Disrupting Patterns: Designing for Circular Speeds'. Chelsea College of Arts, 23 November. Available at: https://www.eventbrite.co.uk/e/52052886585?aff=efbneb (Accessed: 21 November 2018).

Earley, R. (2017) 'Designing Fast & Slow. Exploring fashion textile product lifecycle speeds with industry designers', *The Design Journal*, 20(sup1), pp. S2645–S2656. doi: 10.1080/14606925.2017.1352776.

Etzkowitz, H. (1983) 'Entrepreneurial Scientists and Entrepreneurial Universities in American Academic Science', *Minerva*, 21(2/3), pp. 198–233.

Etzkowitz, H. and Leydesdorff, L. (1995) 'The Triple Helix -- University-Industry-Government Relations: A Laboratory for Knowledge Based Economic Development', *EASST Review*, 14(1), pp. 14–19.

Farrer, J. (2000) *Wool: from straw to gold: an ecological assessment of the lifecycle of wool from cradle to grave and beyond resulting in yarns composed of 100% post consumer waste*. Royal College of Art. Available at: https://researchportal.port.ac.uk/portal/en/theses/wool(7e0cff0d-33df-4717-9172-24ef43f85720).html (Accessed: 2 October 2017).

Fleet, D. *et al.* (2016) 'A case for taking the dual role of counsellor-researcher in qualitative research', *Qualitative Research in Psychology*, 13(4), pp. 328–346. doi: 10.1080/14780887.2016.1205694.

Fowler, N. (2017) *Walking The Plank of The Entrepreneurial University: The little spin-out that could?* Doctor of Philosophy. Uppsala University, Faculty of Science and Technology. Available at: http://uu.diva-portal.org/smash/record.jsf?aq2=%5B%5B%5D%5D&c=21&af=%5B%5D&searchType=LIST_COMING&query=&language=sv&pid=diva2%3A1066548&aq=%5B%5B%5D%5D&sf=all&aqe=%5B%5D&sortOrder=author_sort_asc&onlyFullText=false&noOfRows=50&dswid=-7972 (Accessed: 2 October 2017).

Gaver, B. and Bowers, J. (2012) 'Annotated portfolios', *interactions*, 19(4), p. 40. doi: 10.1145/2212877.2212889.

Gee, N. C. (1950) *Shoddy and Mungo Manufacture: Its Development, Ancillary Processes Methods and Machinery*. 1st edition. Emmott.

Goldsworthy, K. (2012) *Laser-finishing: a new process for designing recyclability in synthetic textiles*. phd. University of the Arts London. Available at: http://ualresearchonline.arts.ac.uk/11638/ (Accessed: 31 January 2018).

Govender, C. M. and Taylor, S. (2015) 'A WORK INTEGRATED LEARNING PARTNERSHIP MODEL FOR HIGHER EDUCATION GRADUATES TO GAIN EMPLOYMENT', *South African Review of Sociology*, 46(2), pp. 43–59. doi: 10.1080/21528586.2015.1009857.

Heale, R. and Forbes, D. (2013) 'Understanding triangulation in research', *Evidence - Based Nursing; London*, 16(4), p. 98. doi: http://dx.doi.org.arts.idm.oclc.org/10.1136/eb-2013-101494.

Hewitt-Taylor, J. (2002) 'Inside knowledge: issues in insider research', *Nursing Standard (Royal College of Nursing (Great Britain): 1987)*, 16(46), pp. 33–35. doi: 10.7748/ns2002.07.16.46.33.c3239.

Hofbauer, K. G. (2008) 'Academic institutions and industry: bridging the gap', *Expert Opinion on Drug Discovery*, 3(4), pp. 369–373. doi: 10.1517/17460441.3.4.369.

Huber-Lang, M. and Neugebauer, E. (2011) 'The dual role of academic surgeons as clinicians and researchers - an attempt to square the circle?', *Patient Safety in Surgery*, 5(1), p. 16. doi: 10.1186/1754-9493-5-16.

Igoe, E. (2013) *In textasis : matrixial narratives of textile design*. Royal College of Art.

Jain, S., George, G. and Maltarich, M. (2009) 'Academics or entrepreneurs? Investigating role identity modification of university scientists involved in commercialization activity', *Research Policy*, 38(6), pp. 922–935. doi: 10.1016/j.respol.2009.02.007.

Kitchener, K. S. (1988) 'Dual Role Relationships: What Makes Them So Problematic?', *Journal of Counseling & Development*, 67(4), pp. 217–221. doi: 10.1002/j.1556-6676.1988.tb02586.x.

Lam, A. (2010) 'From "Ivory Tower Traditionalists" to "Entrepreneurial Scientists"?: Academic Scientists in Fuzzy University—Industry Boundaries', *Social Studies of Science*, 40(2), pp. 307–340. doi: 10.1177/0306312709349963.

Lincoln, Y. S. and Guba, E. G. (1985) *Naturalistic Inquiry*. 1 edition. Beverly Hills, Calif: SAGE Publications, Inc.

Mercer, J. (2007) 'The challenges of insider research in educational institutions: wielding a double-edged sword and resolving delicate dilemmas', *Oxford Review of Education*, 33(1), pp. 1–17. doi: 10.1080/03054980601094651.

Mistra Future Fashion (2018) *Mistra Future Fashion*. Available at: http://mistrafuturefashion.com/ (Accessed: 21 November 2018).

Mønsted, M. and Hansson, F. (2010) 'Creating Space for Research: The Charismatic Entrepreneur as Research Director', *Creativity and Innovation Management*, 19(1), pp. 47–56. doi: 10.1111/j.1467-8691.2009.00539.x.

Mujumdar, A. S. (2004) 'Academic Research Vs Industrial R &D: A Comparison'. Powerpoint. Available at: https://www.arunmujumdar.com/file/Selected%20Presentations/Academic_Vs_Industrial_R&D.pdf (Accessed: 8 January 2019).

Paine, H. (2015) *Laser Shaping: A method for controlling the elastic behaviour of stretch fabrics for a targeted and graduated compressive effect on the body*. PhD Thesis. Royal College of Art.

Penfold, G. (2007) 'Diversification, Design, Strategic Planning and New Product Development: A Jewellery Industry Knowledge Transfer Partnership', *The Design Journal*, 10(1), pp. 3–11. doi: 10.2752/146069207789318036.

Phelan, K. V., Mejia, C. and Hertzman, J. (2013) 'The Industry Experience Gap: Hospitality Faculty Perceptions of the Importance of Faculty Industry Experience', *Journal of Hospitality & Tourism Education*, 25(3), pp. 123–130. doi: 10.1080/10963758.2013.826950.

Polanyi, M. (1958) *Personal knowledge: towards a post-critical philosophy*. London: Routledge.

Puia, G. M. *et al.* (2000) 'The career transition from practitioner to academic', *Career Development International*, 5(2), pp. 106–111. doi: 10.1108/13620430010318990.

Ræbild, U. and Bang, A. L. (2017) 'Rethinking the Fashion Collection as a Design Strategic Tool in a Circular Economy', *The Design Journal*, 20(sup1), pp. S589–S599. doi: 10.1080/14606925.2017.1353007.

Rogoff, B. (1995) 'Observing sociocultural activity on three planes: participatory appropriation, guided participation, and apprenticeship', in Wertsch, J. V., del Rio, P., and Alvarez, A. (eds) *Sociocultural studies of mind*. Cambridge: Cambridge University Press, pp. 139–164. doi: 10.1017/CBO9781139174299.008.

Saidin, K. and Yaacob, A. (2016) 'INSIDER RESEARCHERS: CHALLENGES & OPPORTUNITIES', in *Proceeding of ICECRS*. *International Seminar on Generating Knowledge Through Research,* Malaysia, pp. 849–854. Available at: https://www.researchgate.net/publication/317080260_INSIDER_RESEARCHERS_CHALLENGES_OPPORTUNITIES (Accessed: 9 November 2018).

Santoro, N. and Snead, S. L. (2013) '"I'm not a real academic": a career from industry to academe', *Journal of Further and Higher Education*, 37(3), pp. 384–396. doi: 10.1080/0309877X.2011.645457.

Sauerwein, M., Bakker, C. and Balkenende, R. (2018) 'Annotated Portfolios as a Method to Analyse Interviews', in *DRS2018*. *Catalyst for Change*, University of Limerick: Scribd, pp. 1148–1158. Available at: https://www.scribd.com/document/382349704/DRS2018-Vol-3#download (Accessed: 24 July 2018).

Schön, D. A. (1983) *The reflective practitioner: how professionals think in action*. London: Temple Smith.

Schuetz, A. (1944) 'The Stranger: An Essay in Social Psychology', *American Journal of Sociology*, 49(6), pp. 499–507. doi: 10.1086/219472.

Schutze, H. G. (2000) 'Industrial Innovation and the Creation and Dissemination of Knowledge: Impications for Universitity-Industry Relationships', in OECD, *Knowledge Management in the Learning Society*. OECD Publishing.

Smyth, A. and Holian, R. (2008) 'Credibility issues in research from within organisations', in Sikes, P. J. and Potts, A., *Researching Education from the Inside*. Routledge, pp. 33–47. Available at: https://researchbank.rmit.edu.au/view/rmit:10876 (Accessed: 9 November 2018).

Tijssen, R., Lamers, W. and Yegros, A. (2017) 'UK universities interacting with industry: patterns of research collaboration and inter-sectoral mobility of academic researchers', *Centre for Global Higher Education working paper series*, 14. Available at: https://www.researchcghe.org/perch/resources/publications/wp14.pdf (Accessed: 7 November 2018).

Trash-2-Cash (2018) *Trash2Cash EU funded project, taking waste & making new fibres*, *Trash-2-Cash*. Available at: https://www.trash2cashproject.eu/ (Accessed: 21 November 2018).

Tufte, E. R. (2001) *The Visual Display of Quantitative Information*. 2nd edition edition. Cheshire, Conn: Graphics Press USA.

Unluer, S. (2012) 'Being an Insider Researcher while Conducting Case Study Research', *Qualitative Report*, 17. Available at: https://eric.ed.gov/?id=EJ981455 (Accessed: 7 November 2018).

WRAP (2012) *A review of commercial textile fibre recycling technologies*. Oakdene Hollins. Available at: http://www.wrap.org.uk/system/files/private/Commercial%20textile%20fibre%20recycling%20technologies%20report.pdf (Accessed: 7 December 2017).

About the Authors:

Cathryn Hall, PhD Researcher, Centre for Circular Design (CCD), University of the Arts London; was previously CCD research assistant, Mistra Future Fashion research project. Cathryn is currently undertaking her practice-based doctoral study under Dr. Kate Goldsworthy and Professor Rebecca Earley.

Rebecca Earley, Professor of Sustainable Fashion Textile Design, Co-Director Centre for Circular Design, Chelsea College of Arts (UAL). A printed textile designer by training, Rebecca co-developed The TEN design strategies in 2010 to support designers in engaging creatively with sustainability.