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Entrepreneurial Learning in Practice: The Impact of Knowledge Transfer

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Research, Case Study**

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Abstract

The aim of this research is to provide perspectives on how Entrepreneurial Practitioners, specifically owners of high-tech small firms (HTSF), engage with knowledge transfer and learn. In this paper the authors draw on extant research and report on the views and observations of the efforts of the Principals in two case study companies within the HTSF sector to grow their ventures and develop learning while part of a Knowledge Transfer Partnership (KTP) programme. Entrepreneurial Learning is an area of significant interest due to the interest in Entrepreneurship and the varied ways in which learning can take place. There are many different interventions that can be used to transfer knowledge and develop learning but there is limited, if any, consensus on the effectiveness of these. The research used an Ethnographic approach in two case study companies over an 18-month period. The study concluded that the intervention facilitates an opportunity for learning through disruption with the key barrier to any new learning being established practice. Interestingly, the study suggested that Entrepreneurial Learning was greatly facilitated by ‘on-the-job’ learning.

Introduction

Learning is a vitally important part of any organisations overall success. It is recognised that learning enables organisations to successfully navigate competitive landscapes and manage complex and challenging issues more effectively, (Senge, 1990; Amin and Wilkinson, 1999). In fact, Dosi and Malerba (1996), despite appearing dated, would argue that an important element to any organisations potential success is continual learning – an issue which relates just as much to contemporary organisations. Based on the definition of learning proposed by Kolb (1984) learning is experiential whereby knowledge is gathered from experience. The Knowledge Transfer Partnership, the lens in this study through which Entrepreneurial

Learning is examined, is an experiential learning process designed to transfer knowledge and thereby build learning within small and growing organisations. It is therefore proposed as a key facilitator in learning.

The Knowledge Transfer Partnership (KTP) scheme, in the UK, is specifically designed to help those within entrepreneurial firms to acquire the knowledge they need to pursue growth through a greater commitment to, and development of, competencies in innovation practice and opportunity focus. The link between the entrepreneurial business venturer, the academic in the Higher Education Institution (HEI) and the graduate, the Associate (recruited by the HEI and lodged within the firm), are the key players in facilitating learning that is designed to have a positive impact on the future of the business. The Associate, as an agent for positive, innovative change in the business, brings with him/her new knowledge to be introduced into the business, challenging established practices and processes and supporting innovative step-changes in the business and supporting learning. The placements are temporary, for a period of two years. In a recent independent report by Innovate UK (2015) it was noted, for example, that for every £1 of KTP grant invested up to £8 of net extra Gross Value Added (GVA) was generated. The report also concluded that 94% of Associates said KTP had had a positive impact on their personal/career development with over a third stating the impact had been transformational for their development and career. The success of the KTP is therefore widely recognised and established from the Associate's perspective in terms of learning but not as well articulated in learning terms from the Entrepreneurs perspective.

Knowledge transfer, as the term suggests, is about the exchange of knowledge between Associates in a partnership. The knowledge is primarily innovative research but may address issues of commercialisation amongst other things. The ambition of such knowledge transfer

is the pursuit and exploitation of new, innovative opportunities and, therefore, the facilitation of learning. The theatre for such activity is, primarily, but not exclusively, small to medium sized firms within the science, engineering and technology sectors. The partnership commonly includes, within KTPs, those within a business venture, an academic or team of academic researchers from a HEI and government agencies. It is essentially about the transfer of tangible and intellectual property, expertise, learning and skills between academia and the non-academic community, particularly business practitioners. The 'knowledge' transferred can be formal and clearly expressed, for example, from published research and/or informal in terms of individual experiences and tacit as in residing in the individual without being stated and therefore difficult to articulate in direct communication. Transferring knowledge, particularly tacit knowledge, and facilitating learning, is therefore a complex undertaking. The entrepreneurial business venturer, for example, busy with developing an enterprise, may not be fully aware of, or have thought critically about the wealth of accumulated knowledge that resides within him/her because of years of business experience, therefore distilling this type of knowledge and leveraging value from it can be difficult. The specific challenge to transfer 'knowledge' is therefore to capture, organize, create, and distribute it from one part of an enterprise to another or indeed throughout an enterprise in ways that effect a step-change in the progress of the business venture and to ensure its legacy remains valid for those within the enterprise into the future through the development of appropriate applied learning. Knowledge transfer is, therefore, both potentially valuable and challenging for those engaged in it.

Many high-tech small to medium sized firms emerge because of the creativity and innovativeness of a founding entrepreneur and his or her team and the early development of such enterprises can often be characterised by organic development and considerable

adhocracy. Innovation, in terms of new product or process development, lie at the core of what founders and their teams do, although not always formally recognised and supported. Early practices, that are seen to work, may become established creating tensions as the enterprise grows. The key focus therefore of knowledge-transfer is on supporting appropriate and sustainable learning where the Entrepreneur acquires and learns to implement new knowledge of best practice in business development; where the Associate gains experience of business practice and an opportunity to apply learned theory; and where the academic learns the value of their research in an applied context – all the while facilitating entrepreneurial learning and developing business practices. The KTP process is therefore a form of ‘learning as participation’ as outlined by Coffield (2008) where entrepreneurs learn as part of a constant process of active encounters in situ, (Higgins and Elliott, 2011). As such the KTP provides the authors with a defined context/frame within which to consider learning by entrepreneurs.

The focus therefore of this research is on the Entrepreneurial Practitioner’s learning. Cope (2005) suggests that the entrepreneurship discipline does not currently possess sufficient conceptual frameworks to explain how entrepreneurs learn, concluding that ‘*..entrepreneurial learning is not characterised by the notions of stability, consistency or predictability. Rather, evidence suggests that the concepts of metamorphosis, discontinuity and change more appropriately encapsulate the dynamics of this phenomenon*’, (p. 26). When it comes to working, learning and innovation, Brown and Duguid (1991) argue that ‘*work practice is generally viewed as conservative and resistant to change, learning is generally viewed as distinct from working and problematic in the face of change and innovation is generally viewed as the disruptive but necessary imposition of change on the other two*’, (p40). Cope (2005) however, would dispel the idea, as a misconception, that entrepreneurs are merely

'doers', arguing that *'it is beneficial to view entrepreneurs as 'reflective' practitioners'*, (p380). It is through reflection he argues that experience is turned into learning. Higgins & Galloway (2014) add weight to the importance of reflection in practitioner learning, stating *'the use of reflexivity to critique practice invites entrepreneurs to question claims of existing knowledge and the process of knowledge creation.'*, (p453). In fact, Carland et al (1984) argued that Entrepreneurial Learning is about developing meaning and behaviours through understanding business start-up and growth, (Rae and Carswell, 2001). There does remain limited consensus of how Entrepreneurial Practitioners learn.

In an attempt to address this gap in this exploratory, ethnographic research paper, two of the authors were each embedded in a HTSF as part of a Knowledge Transfer Partnership (KTP) and key decision-makers in each firm were observed and interviewed over 18-24 months to gain insights to Entrepreneurial Learning in that period. In response to Cope's (2005) suggestion, and reflecting those of Brown and Duguid (1991), the authors' aim was to provide critical perspectives on how Entrepreneurial Practitioners engaged with knowledge transfer learn. Specifically, this research sought to explore how Entrepreneurial Learning occurs. In particular this paper addresses the following objectives:

- Explore how technically competent Entrepreneurial Business Venturers (EBVs) learn through knowledge transfer interventions;
- Examine how entrepreneurs view and manage the demands of a changing environment prompted by successful action against what has worked in the past;
- Reflect on how the Entrepreneurial Practitioners learn in high tech small firm environments; and
- Explore what might be the role of significant others and interventions such as KTPs in supporting learning to be effective as business managers.

Entrepreneurial Practitioner Learning: A Theoretical Perspective

Extant research suggests that the entrepreneurial process is dynamic; the constituents of which are the entrepreneur and the entrepreneurial team, the entrepreneurial opportunity and access to key resources, including time as well as financial resources, (Timmons and Spinelli, 2009; Deakins and Freel, 1998). The launch of any venture is an entrepreneurial act, characterised in its early stages by such issues as informality, limitless energy and a high tolerance of risk. Any new business venture will be lacking in terms of many key resources and structures and those working in it, including the founder, who will have few, but very specialist, usually technical skills. Control and communications within such ventures will tend to be highly informal, unstructured and based heavily on the existence of strong personal relationships and on the charisma and energy of the founding entrepreneur. Role ambiguity for those working in the venture, when newly established will be extensive and accepted. The leadership style of the founder will be unique, highly centralised and personalised with undertones of “authoritarianism” often based on ‘founder’ claims and specialist knowledge of proprietary technology. The market focus of the new venture will be close and relational in character with few customers who are well known to those launching or developing the business venture. Any development and growth of the new business venture will likely be organic in character and continued expansion of its operations will bring new stresses and challenges, (Timmons and Spinelli 2009; Kao 1991). The addition of new products and markets to the efforts of the entrepreneurial venture, and the recruitment of new people bringing new specialist skills, will introduce the founder to all kinds of stresses and challenges, both anticipated and unanticipated. The development of the enterprise will be effectuated in character, (Read et al, 2017). As others join the venture they bring with them not only their own specialist knowledge and experience, be it technical or commercial, but

essential views and perspectives as to how the venture might develop and grow. The founder, whose own competency limitations, particularly with respect to, for example, commercialisation or people management may be exposed, presents increasing, perhaps unwelcome pressures to share power, information and influence with others in the venture with appropriate competencies. With an increase in numbers of people working in the growing venture role ambiguity becomes less acceptable and pressure to introduce new, more formalised structures and to define people's roles builds. The founder must decide between continuing autonomy and control or delegation within the business venture, and *learn* to become more and more an entrepreneurial leader, surrendering the intimacy, with the development of innovative technology, that was the genesis of the firm's foundation. At stake, however, is the potential to erode the entrepreneurial culture and climate that had characterised the venture at its launch, (Timmons and Spinelli, 2009; Stewart, 1987). As such the growth and development of the firm is characterised by many complexities and challenges. It is often at this stage that development and learning through such interventions as a KTP are introduced.

What emerges from the discussion thus far and extant research about Entrepreneurial Practitioner learning is that managing the launch and development of a business venture and planning its different stages of development and growth, a dynamic process which has value-adding change at its core, will be very much a case of 'on the job learning' or 'learning-by-doing' and progress in that learning will be a function of considerable 'trial and error', experimentation and experience, characterised by effectuated approaches to entrepreneurial practice and learning, (Read et al, 2017; Oguz, 2001; Stewart, 1987). Rae and Carswell (2001) are doubtful of the ability of formal entrepreneurial education to fully prepare entrepreneurs for success, exclaiming that *'the consensus so far is that entrepreneurship is*

learned primarily by experience and discovery' (p. 151; Cope and Watt, 2000; Pittaway and Cope, 2007). In fact, Gibb (1997) argues that learning comes in many guises including 'learning by copying, learning by experiment, learning by problem solving and opportunity taking, and learning from mistakes', (pp. 19). Arpiainen and Kurczewska (2007) illustrate that *'experience based entrepreneurial education should be encouraged...as this builds emotional cognitive and cognitive readiness'* (p. 152-153). These sentiments are echoed throughout the research which indicates that experiential learning is invaluable to entrepreneurial education (Cooper et al, 2004; Rae, 2007). Indeed, Baggen et al (2016) suggests that *'learning by doing is not only crucial for independent entrepreneurs, but also for employees in the business context, especially for SMEs'*, (p. 203), thus recognising the importance of the approach to the learning of those working with the founder as part of an entrepreneurial team. Pett and Wolff (2016) propose the view that *'a commitment to learning coupled with the tools and capabilities to gather and compile information and knowledge from outside organisational boundaries facilitates the identification of opportunities.'*, (p. 71). Wang (2008) posits the view that *'the more entrepreneurial the firm, the more learning oriented it is, the more likely it instils values that promote commitment to learning, open-mindedness and shared vision.'* (p. 640). The main conclusion drawn is that learning 'in-situ' is a very effective method.

Deakins and Freel (1998) argue, however, that we know very little about how Entrepreneurial Practitioners learn despite it being essential to the ongoing development of the organisation. They recognise the reactionary nature of the Entrepreneurial Practitioners/Founder's learning as they respond to the twists and turns of the entrepreneurial process. *'Entrepreneurs starting a business'*, they argue, *'are unsure about their managerial abilities... they, (entrepreneurs) only become aware of their true ability to manage in the given environment once their*

business is established', (p. 148). When making decisions, taking action and learning from events and crucially from mistakes, experiential knowledge will be core to the Entrepreneurial Practitioner's potential for success, testing their self-belief and building, largely experientially, their level of competencies in managing their way out of those problems and critical events, (Cope, 2005). In addition, what emerges is the concept that the lone entrepreneur has been challenged, and in its place the idea of effective entrepreneurial activity being highly dependent on relationship networks both inside and outside of the businesses (Devins et al, 2002; Harding, 2004; Taylor and Thorpe, 2004; Rae, 2007). The role of the founder's network of contacts, including family and friends, as well as business contacts is crucial; core dimensions of any entrepreneurial practitioner's human capital, (Leitch et al, 2013; Soetanto, 2017). Baggen et al (2016) identify the role of 'significant peers' in providing support to entrepreneur's learning, particularly in the early stages of start-up and business development, people identified as knowledgeable and experienced in business practice with a willingness to share and guide the Entrepreneurial Practitioner as he/she experiences the many challenges of starting, and subsequently developing, a business venture. Such networking activity has come to be viewed as important in providing the high technology/technically savvy, but relatively managerially inexperienced, Entrepreneurial Practitioner with emotional support as well practical guidance in managing the development of the business venture. *'Entrepreneurs learn by responding to challenges while also becoming aware of their limitations'* suggests Soetanto (2017: p. 5). Critical events are identified as being of importance in supporting learning and entrepreneurial business venturers are likely to seek out such network ties often when experiencing difficulties, (Soetanto, 2017; Baggen et al, 2016). McKeown (2010) details that *'entrepreneurial learning within teams was complex, interrelated and often messy...requiring the engagement of external players to trigger change'* (p. 439) – a role often filled by the Knowledge Transfer

process. Team participation in business practices is important however to develop change within an organisation, (McKeown, 2010).

Another area of interest is the role of university-SME engagement on practitioner learning. Wilson (2012) recognised universities as a '*source of strength in the knowledge-based economy of the twenty-first century.*', (p. 2). Baba et al (2009) and Philbin (2012) noted that university-industry collaboration fostered interactive learning by using academics as a conduit for knowledge. Dada and Fogg (2016) further concluded that '*knowledge transferred from universities enhances organisational learning in SMEs.*', (p. 98). However, Hughes et al. (2011), had previously argued that '*practitioners do not make the most of management academics as a source of knowledge.*' (p. 40). This is an issue which is being explored in the context of the KTP intervention within the current study.

Young and Sexton (2003) provide a typology of how entrepreneurs learn, identifying learning at different stages and contexts. They suggest that Entrepreneurial Practitioner Learning might be viewed at times as reactive, reflected in unanticipated emergencies or opportunities, or proactive, in terms of opportunities that are seen to be anticipated. They further discuss that it can be external, in terms of the source of information about or confirmation of the value of opportunities, or internal in terms of the source of knowledge, information and expertise. Similarly, this is outlined by Sullivan (2000) who proposes two types of learning known as 'adaptive' in a change and survival situation and 'generative' whereby experience informs learning and future practice – the role of the KTP process in facilitating both types of learning is evident. Young and Sexton (2003) introduce the idea of the necessity of unlearning as part of the learning process as mental models of what worked in one context

must be unlearned and reformulated as a part of the process of new learning as contexts and circumstances change. They argue that *'successful entrepreneurs are also eager learners. They embrace change as representing opportunities for learning and therefore continually adapt to new and changing circumstances'*, (p. 172). Smilor (1997) further captured the complexity of understanding Entrepreneurial Practitioner Learning – *'effective entrepreneurs are exceptional learners. They learn from everything. They learn from customers, suppliers, and especially competitors. They learn from employees and associates. They learn from other entrepreneurs. They learn from experience. They learn by doing. They learn from what works and, more importantly, from what doesn't work'*, (pp. 344). There is clearly much yet to be understood about how entrepreneurial practitioners/founders learn to launch and develop their ventures with limited consensus on their learning approaches, (Ittaway and Cope, 2007). Entrepreneurial learning appears to be essentially cyclical, suggesting 'learning loops' which emphasise the importance of experience and 'learning by doing' and the value to learning from the crisis event, to knowing what works and what does not in preparation for the 'next time'. The context of the small firm defines a unique context where the challenges of launching and developing a business venture are particularly acute. Consider the observations of Marvel and Lumpkin (2007) who conclude from their research, however counterintuitively, that with respect to technology entrepreneurs the less that they know *'about the ways to serve a market, the greater their chances of using technology knowledge to create breakthrough innovations with it'*, (pp. 807). Cope (2005), reflecting on the dynamics of entrepreneurial learning, suggests that, because of such dynamics, many aspects of entrepreneurial learning remain poorly understood. Indeed, despite providing a dated perspective, the words of Deakin (1996) that *'we do not understand how entrepreneurs learn.... The learning process is poorly understood...'*, (pp. 21-22). The authors' aim in this paper therefore is to provide perspectives on how entrepreneurial practitioners, owners of

small firms engaged with knowledge transfer, learn to help better understand this phenomenon and draw more informed conclusions on the nuances of Entrepreneurial Learning. The lens is not on formal entrepreneurship education but how knowledge transfer, as an intervention, impacts on Entrepreneurial Practitioner Learning.

The Research Approach

Investigating the issue of how Entrepreneurial Practitioners learn is clearly a complex issue. The authors concluded that a Positivist position would not provide the necessary depth of understanding or explanation to fully understand this. Quantitative research provides trends and relationships among variables which is considered unsuitable in exploring the area of Entrepreneurial Learning due to the evolving and emerging nature of this field where the what, how and why still require further investigation and understanding, (Creswell, 2005). As such a Phenomenological perspective was adopted thereby allowing the researchers to better understand the meanings behind practitioner learning and provide an opportunity to explore key changes and underlying influences, (Easterby-Smith et al, 2002; Creswell, 2005). Qualitative methodologies are very valuable in generating rich understandings of specific situations – Entrepreneurial Practitioner Learning in the context of the KTP in-situ within the company means a qualitative investigation was the most suitable, (Morgan and Ramirez, 1984). Specifically, an Ethnographic approach was chosen.

Ethnography is a flexible research methodology which allows for the exploration of a variety of issues including cultural where “*the key task of observation and analysis is to unpack the webs of meaning transformed in the social process whereby reality is constructed*”, (Harvey and Myers, 1995; p. 17). Ethnography provides researchers with an opportunity to stimulate

strategic thinking by providing finite detail on the issue(s) under investigation and acting as a catalyst for potential change and learning, (Cayla, Beers and Arnould, 2014). It has been widely used within a business and management context to investigate a range of issues including consumer behaviour, strategy development and innovation although Moore (2012) calls for greater use of Ethnography in business research arguing that it '*still remains very much on the fringes*', (pp. 173; Cayla et al, 2014; Briody and Erickson, 2014). In fact, Cope (2005) would argue that entrepreneurship research was, until the mid 1990's, reliant on single method survey methodologies to develop understanding and knowledge – which is now considered limited and dated. It provides the opportunity to interpret commercialisation issues in the context of the organisation allowing interpretation and investigation to occur simultaneously whilst providing deep, holistic insights, (Atkinson, 1992; Sayer and Harvey, 1997; Reeves, Kuper and Hodges, 2008; Bryman and Bell, 2015). The relevance of ethnography in the context of Entrepreneurial Learning is further endorsed by Rigg and O'Dwyer (2012) who conclude that it allows researchers to '*explore the feelings, thoughts and meanings people attribute to situations, as they happen*', (pp. 326; Rae and Carswell, 2011). In fact, Plump (2017) also called for wider use of ethnography to better understand organisations and, in particular, entrepreneurs. The exploration of 'learning by doing', as outlined in this paper, supports calls by Carland et al (1984) and Rae and Carswell (2001) to engage in practical and applied approaches to understand Entrepreneurial Learning, (Coffield, 2008). In particular ethnography is an ideal method to understand how research participants view issues and problems. Robinson and Shumar (2014) argue that it is flexible, yet rigorous, and ideally suited to explore practices regarding 'learners' in an entrepreneurial setting. Its relevance therefore to the current topic of investigation and utility to enable exploration of Entrepreneurial Learning was obvious.

Ethnographic research requires the researcher to be part of the environment under investigation, either formally or informally, to undertake participant observation. Essentially it involves observing subjects in their natural settings namely the work environment, (Cross, 1994; Cayla et al, 2014; Eriksson and Kovalainen, 2015; McCabe, 2014) and invites the researcher to engage in endeavours that can capture in-depth informant data ‘*in the moment*’, (Weick, 2002). Ethnography provides multiple benefits not least in terms of allowing the researcher “*to experience close, longitudinal exposure to the context, enabling the interpretation of situations relevant to the area of interest*”, (Sayer and Harvey, 1997: p. 430). Furthermore, as argued by Cayla et al (2014) in their investigation of consumer observations and research, “*where data analytics and surveys provide flattened snapshots, Ethnography contributes an empathic understanding and detailed descriptions..... In effect, Ethnography illuminates the evolving kaleidoscopic nature of culture*”, (p. 56). Despite the clear benefits of using this approach it is not without its criticism especially regarding “*value-laden*” researchers, (Borman and Preissle-Gomez, 1986). However, this is unlikely to cause any issues because multiple perspectives are used to depict the research situation, within the current study and reality, namely different sites, observers, methods, coders and data analysts thereby permitting data and investigator triangulation.

The current research setting was within two small, high-technology firms based in Northern Ireland. Both these companies had little else in common - another reason why Ethnography was selected as a suitable methodology to allow the exploration of unconnected phenomena and entities to identify connections, (Reeves et al, 2008). To set the context, COMPANY 1 was founded in 1989 as a provider of electronic manufacturing services. It currently has 10 staff. The company produces lithium battery-based products and battery management infrastructures. The company has exported for several years and its main markets would be

the Republic of Ireland and USA. Other export markets in recent years include the Netherlands, France, Qatar, Ghana and Tanzania. COMPANY 2, a younger company, was established in 2003 and began trading in 2005. They are a small business of 12 employees focusing on the design and manufacture of innovative 2D and 3D measurement systems for industrial metrological applications. The company distributes globally and works closely with a network of distributors in countries such as South Africa, China, Northern Europe and North America.

The authors conducted an Ethnographic study over an 18-month period. It is critical for a successful Ethnographic study that the observers have an opportunity to engage over a significant period with the environment under investigation – critical failings of Ethnographic research result from snap-shot observations and limited participatory investigations, (Goulding, 2005; Plump, 2017). The KTP allowed the researchers to be embedded within the companies, (Plump, 2017). Two of the researchers each worked in the case companies as full-time KTP Associates, fulfilling a specific work role, whilst also undertaking the role of Observer. During this they engaged in daily observations and collated primary data using field diaries, undertaking semi-structured interviews, reviewing company documentation and engaging daily with key informants namely management and staff – essentially this allowed the observers to be immersed in the research setting and gather “*empirical insights that are normally hidden*”, (Reeves et al, 2008: p. 2).

Interviews were used as an important data collection tool. These are considered key Ethnographic techniques common to the Ethnographic approach whereby key in-depth conversations and practices, both formal and informal, can be documented and captured through participant accounts, (Wynn, 1991; Orlikowski, 1992; Harvey and Myers, 1995; Brewer, 2000; Maggs-Rapport, 2000; Yin, 2003; Goulding, 2005; Denzin and Lincoln, 2005;

McCabe, 2014). Ethnographic interviews are key to collating generalised information from research subjects, (Spradley, 1976). These informed the case studies. The semi structured interviews took place in April 2017 in each of the case companies. 12 topic areas were chosen to explore Entrepreneurial Learning in small firms and formed a set of predetermined questions although the interview structure allowed for additional probing and exploration – a key flexibility of semi-structured interviews, (Kvale, 1996). (See Appendix 1). The Observers carried out 2 interviews in each company – all interviews were completed with two Principals who were members of the senior management team of the business venture. These interviews were carried out face to face. The interviews allowed the researchers to probe and explore emerging issues in more detail, (Reeves et al, 2008). In addition, the interviews allowed methodological triangulation which is very useful when trying to understand and explain complex phenomena such as Entrepreneurial Learning and to add value to interpretations presented in the research, (Reeves et al, 2008). The participants for interview were selected using a purposive sampling technique whereby they were selected due to ‘*qualities the participant possesses*’, (Etikan et al, 2016: pp. 2). Essentially the interview participants were selected due to their knowledge and experience of either Company 1 or 2 and were part of the entrepreneurial founding team of the organisation, (Bernard, 2002). The use of purposive sampling is suited to the collection of qualitative data and the collection of information-rich data, (Patton, 2002; Etikan et al, 2016). It is further suited to the current study as purposive sampling emphasises developing comprehensive and deep understanding of the phenomenon under investigation which can only be achieved by ensuring that study participants have the insight to contribute to the study – this perfectly suits the objectives of the current study and the Ethnographic research approach chosen, (Miles and Huberman, 1994; Etikan et al, 2016).

To further enhance the value of the study, the Ethnographic data was analysed by both the Observers and the other authors of the study. This was proposed by Lauer and Asher (1988) as good practice within other Ethnographic studies and minimises the impact of bias and misinterpretation of outcomes and findings. The interviews were recorded and analysed using Thematic Content Analysis. Based on the interview findings and case studies both common and uncommon threads were identified, as proposed by Goulding (2005), and used to describe Entrepreneurial Learning. This is typical of Ethnographic studies where patterns are drawn from the multiple interpretations as well as differences and unique characteristics and observations.

In summary, the research framework was as follows:

- Longitudinal diary recordings and observations – *18 – 24 months*
- Semi-structured in-depth interviews – *4 Interviews (2 in each company)*
- Ethnographic case studies developed – *2 Case Studies*

The Research

Company Case Studies

Both companies in the research were Northern Irish high-tech small firms - COMPANY 1 operates in the electronics sector and COMPANY 2 the metrology sector. COMPANY 1 was founded by P1, the current Managing Director in 1989. The company has had a highly-diversified product portfolio that has evolved over the years. The company has specialized in recent years by identifying opportunities to grow its own products by developing an innovative energy storage solution. It was against this backdrop that the Knowledge Transfer Partnership with Ulster University began in March 2015. P2, the founder's son, joined the company five years ago on a full-time basis and was the author of the KTP project.

Company 2 was established in 2003 and began trading in 2005. The company originated from a PhD project completed by the Director of the company, P3. His PhD project created an innovative new technology which was then developed into a marketable product. This technology developed into the company's first product - the 2D product - identified as the world's fastest and an award winning measurement system. As an innovative company, several further ground breaking new products have been developed, including the world's first 3D scanner that can measure surfaces and edges in 3D. The company initially began selling into the sheet metal industry, but new products and applications have seen the development of applications in other industries such as the medical and aerospace sectors. As with COMPANY 1, COMPANY 2 distributes globally and works closely with a network of distributors in many key regions. P4 is the wife of P3 and followed a liberal arts degree before supporting her husband to set up the business.

In summary, despite operating in different sectors and originating from different roots and motivations, the case study companies both show similarities in terms of size, growth potential and their global focus.

Knowledge Transfer Partnership Overview

The Knowledge Transfer Partnership programme is a UK wide programme that helps businesses improve competitiveness and grow through transferring knowledge and skills. The programme does this by way of an academic institution, an Associate and company collaboration. The programme in both case studies was intended to facilitate a "step-change" within each company, moving each from organic growth and operational focus towards a

more managed and strategic development. Both case companies set out ambitious plans to increase profitability five-fold, on average over 36 to 60 months, through planned commercialisation programmes. As KTP Associates, two members of the research team were placed in the case-study companies for a period of two years and were responsible for effecting the commercialisation programme.

Learning Issues in Case Study Companies

The researchers observed that a key challenge faced by Principals in both case companies was in relation to managing personnel. This was clearly a critical area from the outset and posed a significant learning challenge. P1 highlighted the challenge finding staff who were self-motivated and who wanted to grow with the company and share the company's vision. He stated, 'There is no room for disruptive influences from those who are constantly challenging or criticising staff or the company when all are trying their best'. In Company 2 both Principals appeared to view HR as being in the realm of conflict management; P3 stated '*I've literally wanted to pull my hair out...over a HR issue*' and P4 expressed that HR '*was very challenging and still is*'. P3 stated HR as a weakness, indicating that they were not '*hard-nosed enough on the HR side of things*'. In both companies' staff retention and employee development emerged as important stress-points for all Principals.

Three Principals (Company 1 (2) and Company 2 (1)) were highly skilled technically. Educationally, both Principals in Company 1 had similar backgrounds in terms of technical disciplines studied but achieved their qualifications in different ways. P1 took a work-based route, studying on a day release basis whilst completing an engineering apprenticeship with a major manufacturer. P2 took a more academic route supplemented with periods in the family

company on a casual basis before studying for a postgraduate management qualification whilst working for a large multinational manufacturer.

P1 and P2 were highly qualified as engineers and P3 held a PhD and had a strong 'technical background in software engineer and computer vision with P4 having a liberal arts background. The interviews conducted with Principals in Company 1 revealed stark differences in views on the company's challenges leading to tensions over a prolonged period which eventually resulted in P2 leaving the company to set up a new business in a related field. P2 saw the changes achieved during the KTP as key to changing the business model by establishing a long term and sustainable business plan which emphasized the company's own products rather than continual reliance on winning sub-contract work and therefore broadening the portfolio of key customers to reduce risk. Implementing this change project brought P2 into conflict with P1 and this was exacerbated by financial pressures facing the company from mid-2015 onwards as the Principals had different answers to the organisation's challenges. The lack of a shared vision on the future progress of the company was an issue that emerged from the research in Company 1 with P2 mentioning several times his regret that this had not been achieved leading to his decision ultimately to step away from the company. P2 stated *'If you embark on something, you really have to understand what it is you're about while you're doing it. What your scope is, what your targets are, align everyone in the same direction and (set) goals to achieve it (the vision). That was probably the most difficult thing in the company because the goalposts changed quite frequently'*.

In Company 2 over the course of the KTP it has become clear that both Principals had learned a great deal, and both were better prepared in different ways to personally meet challenges. At the beginning of the partnership, for example, it was evident that the company

had issues with distributors in a specific country, and both Principals did not seem to know how to handle the situation. P3 indicated that distribution management was a challenge stating they *'started a relationship with a dealer and had basically thrown everything in...they [distributors] hadn't held up their end of the bargain'*. With experience over the span of the project, advice from the KTP network and trial and error the company had successfully begun to reduce the impact of the distribution blockage in that specific country. What appeared to emerge from the research was that both Principals were thriving on learning through hands-on experience. This has been reflected in the interview with P3, remarking that *'it's one of the best ways for people to learn is to do it'*. In discussing the benefits of on the job learning versus formal management qualifications, P1 stated that he felt it was better to buy in talent rather than develop it in-house as a small business could not afford for key staff to spend a significant amount of time out of the business on training courses - *"being a small company it should be borne in mind that every hour spent out of the business by key staff reflects on turnover and it is often better that we hire knowledge than pay to nurture/develop it, especially in a growth situation"*. Furthermore, P2 felt that he had learned more through work experience than he had in a classroom scenario.

P1 highlights the current challenge of finding the right investment partner who has not only the funds but the connections to help the company grow and become an established provider of energy storage solutions. P2 however took the view that the company's key challenges were around cash flow, succession planning and establishing a long-term strategy. He stated *'Key challenges are around funding and cash flow, succession planning and the CEO's exit strategy and the long-term strategic aim. That commitment and focus to a product or service that will align with a solid strategy and mission to allow the company to become investable and therefore achieve the things that the CEO wishes.'* While working with P3 on embedding a trade show process within the company it became apparent that new techniques regarding

the process had to be learnt including the importance of pre-show and post show planning. Lessons which had not been appreciated at the time. Entrepreneurial learning was evident when the process was put into practice as P4 remarked that they now saw the importance of a set process and the benefit of putting new practices into place that had not been there previously. As P3 stated *'previously I would just see an exhibition as a logistical thing, whereas now I see it as a, you see how important the run up...the follow up is to it, whereas before that I maybe just...I didn't appreciate'*. Entrepreneurial learning was also apparent with respect to P4. The development and implementation of a new improved distributor management process was initially dismissed by P4 who had taken the view that distributors just needed 'a telephone call'. On seeing the new process in practice and its potential to impact on attaining new distributors P4 changed perspective.

Both P1 and P2 agreed that they felt better prepared now than when they first became involved in the business venture but for different reasons. P1 indicated that he now no longer had a family to support, he could be less risk averse and was better placed to take the risks necessary to take the business forward. P1 also realized and accepted that, to grow the business, he would require outside investment and would need to relinquish an element of control as a consequence, which he accepted would be a major personal challenge having run his own business for almost 30 years. P2 cited knowing where to go for advice and support, recognizing the importance of culture and vision and building consensus among colleagues and employees as the main reason for feeling more prepared to run a business now. Thinking about the challenges ahead, P2 felt that he would need to better evaluate how he spent his time so that he could complete more high value tasks more often in order to bring in the necessary revenue to drive his new business venture forward.

Rather paradoxically, what appeared from the research was that P3, as a highly technical innovator, was reluctant to introduce change and new ideas within the company. He appeared, for example, reluctant to agree to the development of a new company website. P3 appeared to hold a view that if something does not seem broken why improve it? This block in the project was potentially due to a lack of trust. It appears that as the KTP project has progressed P3 has become more open and relaxed with listening to the ideas of others. Indeed 20 months into a 24-month-programme both Principals have indicated that they have increasingly come to learn from others, particularly from outside the company. P3 stated that they would *'try and find somebody that's had a similar experience or somebody that does that all the time, and just to try and put things in perspective'*. Similarly, P4 stated that the company could *'pick up the phone and talk to them [mentors] about something very specific and have unlimited support'*. It is evident that both Principals have learnt through observations and interactions with both external and internal sources. In terms of feeling prepared for starting the business venture, P1 stated that having a supportive family, assets to borrow funds against and a network of potential customers from previous jobs were all factors which helped to provide a conducive backdrop to starting and developing any business. P2 also highlighted that a network of contacts is essential to starting a new business venture. P2 also felt learnings from previous experience would be an advantage in his new business venture.

Discussion and conclusions

What becomes clear from the case studies is that the KTP interventions and Associates represented a significantly disruptive influence on the progress of each company and an opportunity for new learning, though this was not always understood, or accepted, by all the

Principals in each venture at the time – a position supporting arguments presented by Cope (2005) where learning is not ‘*predictable or stable*’, (pp. 26). Each project sought to widen the perspective of the case study ventures beyond organic development, moving primarily from a technological innovation focus towards a more organised strategic engagement with commercialisation which demanded a step-change in existing practices and attitudes. Learning was therefore required both individually and collectively as an enterprise. The disruptive nature of the pursuit of a step-change in business practices in each company, confronted the Principals with a challenge to identify and acknowledge where their own individual strengths and weaknesses lay in terms of business practice and recognise their learning gaps. This reflection, similar to that concluded by Cope (2005) demonstrates the ongoing existence of ‘*reflective practitioners*’, (pp. 380; Higgins and Galloway, 2014). Three of the four Principals, for example, were very clearly highly qualified and experienced in their respective technologies, what we might classify as ‘known-knowns’. In auditing their competency portfolio, this highlighted where they were deficient and were challenged to seek remedies. The management of personnel and the generation of sales in each case study were clear examples where all the Principals identified competency deficits – previously acknowledged by Timmons and Spinelli (2009) and Read et al (2014).

All the principals acknowledged the potential role of significant others as a means of compensating for a lack of competency in specific areas of business practice corroborating arguments by Timmons and Spinelli (2009), Rae (2007), Taylor and Thorpe (2004), Leitch et al (2013) and Soetanto (2017). This study did not however suggest that networks were more or less important at different stages of business development/growth, as concluded in previous studies, but found their overall impact on Entrepreneurial Practitioners to be significant. Formal and informal collaborative networks are established and provide a

support system for the Principals. What was also required from each Principal in the case study ventures was an appreciation that there had to be a degree of ‘unlearning’ of what might have been useful practice at an earlier time in the business venture’s development but was no longer so, (Young and Sexton, 2003). As a prelude to effective learning in a new and changing environment, emerging because of the impact of the KTP project, this critical review of what is known and the need to ‘unlearn’ it, is essential if new learning is to be accommodated. The research case studies highlighted a key theme that holding on, uncritically, to an ‘established practice’ because ‘it had always worked before’ emerges as myopic and a barrier to new learning by, for example, McKeown (2010). Similar to Hughes et al (2011) there exist barriers to new learning from the KTP due to established practices. However, the positive impact of the KTP intervention on growth and development within the companies supports the positive role, generally, of University-SME engagements, (Philbin, 2012; Dada and Fogg, 2016). Research has indicated that trust, transparency and a shared vision are all important factors to create an entrepreneurial learning environment within teams. Problems in such areas have been identified by principals in both companies.

Not surprisingly what emerges in this study is the importance of ‘on-the-job’ learning. The value of experience is clearly crucial, with Principals inclined to favour such an approach to learning to any formal, externally derived format similar to conclusions drawn by Coffield (2008), Higgins and Elliott (2011), Wang (2008) and Pett and Wolff (2016). Policy to stimulate entrepreneurial activity through education should therefore encourage the adaptation of educational programmes to include a less formal practitioner-based approach, which would promote real world experiences and learning as previously argued by Gibb (1997) and Rae and Carswell (2001) who remain contemporary in their arguments today. *‘Pedagogical approaches must place more emphasis on practice and experiential and*

reflective methods in order to develop and enhance a critical way of thinking in order to embrace fully the complexities of entrepreneurial learning.' (p. 455). This echoes work by Gibb (2002) and Baggen et al (2016).

A valuable bonus from this approach to learning, acknowledged by the Principals, was an emergent appreciation of just how much they appeared to know already, almost intuitively; a sense of 'unknown-knowns'. This knowledge becomes 'known' and appreciated only when an action or a decision is undertaken. As P3 stated '*you maybe don't appreciate the skills you have already*', it is only by '*learning-on-the-job*' that '*you are getting to appreciate the skills that you do have*'. Once again, the importance of being self-aware and in knowing and acknowledging individual strengths and weakness is highlighted. What is also identified is the need for business venturers, in identifying and acknowledging where individual strengths lie, to resist the temptation to 'hang-around' where they feel most comfortable, to the potential detriment of the wider development of the enterprise. The competency of 'getting out of a comfort' zone to learn new skills emerges as important, to learn how to manage human relations in the venture effectively and positively – an argument previously presented by Timmons and Spinelli (2009). An additional conclusion drawn indicates that all Principals, to varying degrees, took time to recognise the value of new learning – either **before** fully engaging in it or **after** when evaluating the full impact. Previously Young and Sexton (2003) and Deakins and Freel (1998) had argued about Entrepreneurial Learning being reactionary but the value of learning was never fully considered. This is a very interesting outcome and shows Entrepreneurial Practitioners learning process has time delays and therefore learning interventions cannot normally deliver immediate impacts to the practitioner and/organisation.

Learning is recognised as a life-long journey for the Entrepreneurial Practitioners in this research who recognise the need to make such a commitment. The SMEs in the case-studies define a crucible for rapid and intensive learning like no other as highly qualified individuals in science, engineering and technology seek to tune into an unfamiliar landscape characterised by what might be described as the softer subjects of people management and customer relationships. The extent to which the technological issue is a factor in understanding the peculiarities of the high tech small firm (HTSF) still needs to be more fully understood however along with the duration of the learning cycle/process. Progress in this relatively less comfortable and poorly understood space for such individuals demands an openness to new learning possibilities but it must be recognised may distract from efforts where natural instincts and training are drawn. As the small business grows those seeking to manage that process must learn new tricks or risk failure. Crisis events provide some of those possibilities for new learning but also bring stress and anxieties that can exacerbate already tense circumstances. Responses demand a level of pragmatism, a level of generosity and a lot of faith, in one's self and others. There is a need too for an acknowledgement of the emotional investment to be made in the pursuit of new learning if it is to be truly effective.

The contribution of this research is multi-fold. It contributes to extending understanding regarding Entrepreneurial Learning and the impact of interventions such as KTPs on this process. It will benefit entrepreneurs, both now and in the future, by better understanding and explaining their learning experiences. It also contributes to endorsing Ethnography as a viable business research method responding to calls by, for example, Moore (2012). Finally, it provides insights to academics involved in developing, designing and managing formal entrepreneurial education interventions through identifying trends, patterns and facilitators in this education process specifically experiential and practice-based learning 'on-site'.

In this paper, the authors aimed to provide perspectives on how Entrepreneurial Practitioners, owners of high-tech small firms, engaged with knowledge transfer and learn. They have drawn on extant research and reported on views and observations of Principals in two case study companies within the high technology sector. They have presented several observations that contribute to extant research and offer future research possibilities. The authors acknowledge there are limitations to this research; although an Ethnographic approach gave deep and meaningful insights it has only allowed for two companies to be researched in depth however the intent with this study, similar to other qualitative studies, was to describe Entrepreneurial Learning in practice as opposed to produce generalisable results therefore a small sample size was appropriate. In addition, the study was geographically restricted to Northern Ireland, although at two geographically distant locations in the province, thereby minimising any potential geographical biases or nuances. Future studies could focus on other regions and locations throughout the UK, Ireland and globally thereby reflecting Entrepreneurial Practitioner Learning as opposed to geographically similar practices. Finally, to minimise potential researcher biases in data collection and analysis two Observers were involved and four researchers analysed and explored the data. The researchers conclude that any limitations did not have a negative impact on the study, reflected in the conclusions drawn, and, as opposed to presenting challenges, provides opportunities for future research to replicate this study in other regions, geographies, sectors and industries engaged in knowledge transfer. This research could be expanded to include a larger number of companies in the future, although more companies may negatively impact upon richness and depth of data gathered. Future research possibilities could include investigating how entrepreneurs learn within different industries. Do entrepreneurs in the creative industries

learn differently than that of technology entrepreneurs? Also do entrepreneurs learn differently at various stages of their entrepreneurial journey?

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APPENDIX 1 – Research Questions

1. May we discuss when you started with the business and what motivated you to become involved in the start-up/business venture
2. Talk to me about your educational and professional qualifications at the time.
3. Would you give me some insights to how would you characterise the circumstances in which you were trying to launch/develop the business? (*Turbulent, challenging, benign, calm*)
4. Thinking back on it now would you talk to me about what, for you personally, were the key challenges you faced in managing your own small technology business? (*in technological innovation and NPD, in finding customers and keeping them, in seeing off competitors, in managing people, in planning strategically for company development*)
5. Thinking back on it now might we discuss the ways in which you personally felt prepared for the challenges of managing a small technology business at that time?
6. Would you give me your thoughts on how would you characterise the environment in which the company is operating today? (*Different, more turbulent, more challenging, more benign, more calm?*)
7. Would you talk to me about how you personally think the challenges that the business is facing now have changed, (*and how*)
8. Would you share with me your views on how better prepared you feel you personally are to meet the current challenges, (*and in what ways*)
9. Looking forward, what do you see are the future challenges for you personally in managing the progress of the company

10. Would you talk to me about your thoughts on developing professional management competencies on the job as opposed to participating in formal management training programmes