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Entrepreneurial Learning: Peripherality and Connectedness

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Purpose

This article explores the roles of peripherality and centrality in relation to entrepreneurial learning and development. Peripherality has previously been considered from a mainly geographical perspective as being remote, loosely connected, and marginal. A broader conception of the topic is addressed, asking: in what ways is peripherality relevant to entrepreneurial learning? How can centre-peripheral connectivity enhance this? What are the implications for communities, learners and educators?

Design/methodology/approach

Discourses of entrepreneurship development relating to policy, economics, geography and culture favour the concept of centres, which attract attention, resources, activities and people. Whilst peripherality is an enduring topic of interest in regional studies, it is widened through using the conceptualisation of Legitimate Peripheral Participation in social learning as a methodological lens for the study. A case study of the technology sector in Cape Breton, Canada is included to illustrate peripheral entrepreneurship.

Findings

The article suggests ways in which peripheral-central relationships can be a positive factor in entrepreneurial learning. It suggests that rebalancing the bidirectional 'flow' of knowledge, talent and resources between centres and peripheries can enhance the value of peripheral entrepreneurship, learning and innovation.

Social implications

The article connects with prior work on community economic development, offering observations for entrepreneurial learning and development of knowledge-intensive businesses in peripheral areas. Boundary-spanning leadership and skills are required to facilitate peripheral-central interaction and entrepreneurship.

Value/Originality

Peripherality is defined more widely than in prior work, suggesting peripheral learning is part of the fundamental human experience and offers new insights, innovations and opportunities which can create shared value. A conceptual framework for peripheral-central entrepreneurial learning is proposed, which may assist in rebalancing central-peripheral value creation, innovation and regeneration.

Key Words: Peripherality, Entrepreneurial Learning, Education, Community Economic Development, Innovation, Technology

Entrepreneurial Learning: Peripherality and Connectedness

Introduction

This article explores the concept of peripherality in relation to entrepreneurial learning. The topic of peripherality, and the role of learning in understanding centre-peripheral connectedness, is of growing importance as the complexity of these relationships change (Danson and De Souza, 2012). Whilst there has been extensive work on peripherality in relation to economic and regional development, and on related topics such as rural enterprise and tourism, there has been much less exploration of the connections between the wider definition of peripherality which is proposed, and the study of entrepreneurial learning. The article uses Wenger's theory of legitimate peripheral participation (LPP), as a theoretical lens to interpret peripheral-central learning relationships, and develops a conceptual map which applies this to peripheral entrepreneurial learning (Lave and Wenger, 1991; Wenger, 1998).

The concept of peripherality has been current in economic geography (Danson and De Souza, 2012), regional and European studies (Copus & MacLeod, 2001), and in rurality for nearly two decades (Anderson, 2000). It has been less explored in connection with entrepreneurial learning 'at the periphery'. Peripherality is normally defined geographically in terms of remoteness and inaccessibility, being located close to outer boundaries, loosely connected, marginal, less important, even dispensable (Anderson, 2000). This article takes the concept of peripherality beyond the purely geographical, suggesting that it can also be defined as marginal participation in social, cultural, economic, political, ethnic, and intellectual terms. Hence, peripherality is a fundamental part of the human experience, not simply a state of geographic marginality. An economic migrant can be in a major city, as an ethnic, social and economic outsider, and experience their peripherality in every sense, including distance from 'home'.

The concern of this article is with the human and social experience of peripherality, and its implications in terms of learning, entrepreneurship, and connectedness with the perceived 'centre'. It suggests that, whilst the notion of centrality tends to be privileged as a normative value, insights may be available at the periphery which are less accessible at the 'centre of things'; and that learning experiences at the periphery may differ from those at the centre. However, creating shared value from those insights is likely to depend on the strength of central-peripheral connections. To understand these relationships, the article uses as a methodological lens the concept of 'legitimate peripheral participation' (LPP) developed as part of the social learning theory of 'communities of practice' by Lave & Wenger (1991) and Wenger (1998). This concept was developed from a social learning, rather than geographical, grounding of peripherality, and its adoption in this way is consistent.

Entrepreneurship may be considered as a peripheral activity, since entrepreneurs have often been social, economic, or ethnic outsiders in ordered societies. From an historical perspective, people from marginal groups were more likely to become entrepreneurs than those in the social, demographic and economic mainstream. Migrants have been, and continue to become 'necessity entrepreneurs' in order to participate economically in many societies where they are marginal and excluded from mainstream opportunities. Williams (2008) has explored the role of the informal and 'grey economy' at the margins of society. The entrepreneurial innovator may be considered as a maverick misfit with radical new ideas, whilst entrepreneurship educators often experience a degree of academic peripherality, especially in smaller institutions where they can be the sole voice of entrepreneurship.

The article defines entrepreneurial learning as an experiential process of learning to recognise and act on opportunities (Rae, 2015) and of shared value creation (Lackéus, 2016); its focus is how this learning is enacted in a peripheral context. Learners encounter their own peripherality, as defined here, in many ways

which may disadvantage them. It may be helpful to understand whether peripheral learning has special qualities; and how learners can use their learning to connect periphery and centres in their own terms.

The development of Information & Computer Technology (ICT) based businesses, and more recently Knowledge Intensive Businesses (KIBs), is considered as a means of achieving economic development through enhancing connectivity in peripheral areas, as older industries decline and since Internet access became widespread, although remote areas suffer disadvantages in terms of bandwidth and speed (Copus & Macleod, 2001). Writers including Irvine & Anderson (2008) and Crone (2012) explored ICT-related development of small firms in peripheral regions. The article considers the relationships between entrepreneurial learning and peripherality in the field of ICT-based KIBS through a specific case study: an innovative learning model in the information & computer technology (ICT) cluster in Cape Breton, Canada. This focus accords with the subject of the special issue on entrepreneurial learning dynamics in knowledge-intensive and technology businesses.

The article explores three related questions derived from this exposition:

1. In what ways is peripherality relevant to entrepreneurial learning?
2. How can centre-peripheral connectivity enhance this?
3. What are the implications for communities, learners and educators?

The structure of the article addresses these questions firstly through a consideration of the relevant literature and their connections in the fields of peripherality, entrepreneurial learning, and legitimate peripheral participation. Using this theory as a methodological lens, a conceptual map for entrepreneurial learning in conditions of peripherality is proposed. This is used to explore the case of a learning innovation in the cluster of Knowledge Intensive Businesses in Cape Breton. This informs a discussion of the implications for community, learners and educators.

Literature review

Entrepreneurial learning

This section addresses relevant strands of prior work in entrepreneurial learning with the topic of peripherality. Taking a definition of entrepreneurial learning as 'recognising and acting on opportunities as a natural process which can be applied within both everyday practice and formal education' (Rae, 2015:5), the topic has itself moved from a peripheral to a more central role in this subject over the past 15 years, although Wang and Chugh (2015) remark on the lack of consensus in defining the topic and on the predisposition to considering how individual learning can be integrated into collective or organisational learning. They address three significant types of learning (individual and collective; exploratory and exploitative; and intuitive and sensing) in relation to future challenges for the subject: how to integrate individual opportunity-seeking with organisational advantage–seeking behaviours; developing skills and resources for opportunity exploration and exploitation; and the need for understanding how entrepreneurial opportunities arise (Wang & Chugh, 2015: 36).

The contribution of an entrepreneurial learning, as distinct from educational, approach is that learning is primarily experiential, situational and contextual; often outside the educational institution; individually and socially mediated; and centred on translating ideas and problems into opportunities and actions (Erdelyi, 2010). In a period of twenty years, a range of perspectives on entrepreneurial learning have been developed, but without a single generally accepted theory (Rae & Wang, 2015).

A continuing strand from early works on entrepreneurial learning has been the notion that individuals experience situational insights and instances of deep, transformative learning within short time periods

(Cope & Watts, 2000; Rae, 2000). The literature on entrepreneurial creativity has many references to the notion of 'aha' and 'lightbulb moments' (e.g. Penaluna et al; 2010; Beeman & Kounios, 2009), describing the instant when an individual becomes consciously aware of an idea or insight arising from the subconscious mind. Creativity involves ephemeral thoughts and ideas surfacing from the subconscious and connecting with external experiences. These transient encounters can manifest deeper subconscious thought processes and resources. Entrepreneurial moments are those in which new meanings are perceived, generated, and acted upon (Rae, 2015). This prompts the question: do open 'thinking spaces' at the periphery prompt such ephemeral insights to occur?

The study of entrepreneurial learning has multiple connections with entrepreneurship education, which generally occurs in more formal institutional settings (QAA, 2012). Entrepreneurship education can serve a number of purposes in peripheral contexts and communities. It can promote an enterprising culture, and engender indigenous entrepreneurial activities which support self-employment, rejuvenate existing business and organisations, and aim to create local economic growth. There has been extensive research on the role of entrepreneurial education, training and development in rural areas and, for example, into the entrepreneurial skills of farming businesses (Seuneke, 2014). Education can be considered as a contributor towards individual and shared learning at an organisational and community level.

The results of such investments in peripheral settings are mixed, uncertain and long-term (EGIS, 2015; Bhrádaigh, 2010). The prevailing cultural norms and context of the community are powerful influences. A peripheral location may seem an unrewarding place to start or run a business, and less likely to attract new entrepreneurs. Yet, in many rural communities, micro-enterprise is both a norm and necessity as part of the 'habitus' of rural life (Atkin, 2003). However, running traditional farming, fishing and hospitality businesses without innovative and entrepreneurial approaches is unlikely to provide longer-term growth and employment, so the question is how new approaches, such as marketing, technology, and strategic business modelling, can drive innovation and new value creation in a peripheral context?

A possible reason for the absence of a coherent theory for entrepreneurial learning is that writers addressed the concept at a methodological and conceptual, rather than at a philosophical level. Thus, such works had to be understood within existing categories. However a recent contribution from Lackéus (2016) proposes entrepreneurship as an educational philosophy of learning which creates shared value for others. This thesis provides an integrative approach between education and learning for entrepreneurship; connecting individual and shared learning; and addressing entrepreneurship as a means of creating a range of shared value for wider benefit. This approach, whilst still formative, has potential for informing entrepreneurial learning at the periphery. Hence we move to consider the concept of peripherality.

Geographic and regional peripherality

Prior work in the field of peripherality originated largely from contributions in the areas of economic geography, regional and rural studies, as summarised in this section. Early understandings were of peripherality as purely geographical isolation, but as the field developed this simplicity became more nuanced. The Norwegian sociologist Naustdalslid observed "...there is no such thing as a single centre-periphery theory or concept...it is difficult, if not impossible, to extract any common element from the wide variety of usages of the centre-periphery metaphor..." (Naustdalslid 1983, p17).

There is a consistent theme in the literature of the effects of space and the 'tyranny of distance' between peripheral districts and urban centres, causing both isolation and insulation (Warntz, 1967; Anderson and McKain, 2004). Isolation brings business disadvantages, increasing costs, and making remote customer acquisition challenging. Distance creates a unique rural experience with the 'friction of distance' bringing

resultant benefits, costs and barriers to communication but simultaneously differentiating the rural. However, some effects can be reduced by making a local presence global through internet technologies.

Within the field of Regional Studies, the concept of 'the new peripherality' emerged in a context of changing patterns of cultural and knowledge production, with a given locality being no longer either centre or periphery, but potentially central on one scale and peripheral on another (Danson and De Souza, 2012). This movement redefined peripherality (Danson et al, 2013) through a range of perspectives and examples which demonstrated that it was no longer a unidimensional concept, but complex and contested, in which the relationships and connections between 'the centre' (or centres) and peripheral regions partly define the periphery (Danson and De Souza , 2012).

Earlier work in the European policy arena noted the disadvantages of peripherality for businesses in terms of poor utilisation of ICT and inadequate networks, leading to higher costs and lower service quality (Copus & MacLeod, 2001). This study identified multiple elements of peripheral disadvantage in conventional economics, noting again "the tyranny of distance" at the heart of such theories, accessibility and transport costs being major factors. Periphery was defined geographically as a region with low accessibility, but also as a contextual category loaded with numerous meanings: 'where relative location can explain only part of regional economic performance, it is the place where nonspatial issues come into play'. (Copus & MacLeod, 2001:49).

There is a growing phenomenon of peripheral post-industrial settlements becoming depleted communities, such as Cape Breton (Johnson & Lionais, 2006). Bhrádaigh (2010) reported how 'collective effervescences' of social entrepreneurship and community organisations emerged in the cultural context of the Gaeltacht of Ireland, noting the long-term emergence of entrepreneurship over several generations, in which government agencies promoted rural entrepreneurship to overcome historical distrust of entrepreneurs. These examples illustrate the significant role of community activism as a factor for regenerative entrepreneurship.

Anderson & Irvine (2003) explored the special qualities of 'otherness' yet disproportionate vulnerability of peripheral places to global competition and external factors such as economic shocks. This has been developed in subsequent work on entrepreneurship and place by Anderson & Gaddefors, (2016), concluding that entrepreneurship can operate as a community phenomenon to realign the meanings and attributes of the social and spatial boundaries of place. There has been significant work on entrepreneurship in rural areas, including the development of the farm-based enterprise (Seuneke, 2014) and the socially embedded nature of family-run microbusinesses in peripheral regions (Jack & Anderson, 2002; Bosworth, 2012).

The works of Bourdieu (1986) and Putnam (2000) inform thinking on social capital in peripheral areas, studying the qualitative characteristics of civic society, centring on social values and norms supporting associational behaviour, networks of co-operation, and civic activity. This is relevant to the development of peripheral entrepreneurship, as 'civically engaged' communities are more likely to experience success in economic development, not only for material gain but through personal relations and networks of relationships which generate trust, establish expectations, create reciprocal obligations and enforce norms of conduct' (Hudson, 1999: 184). Communities able to accumulate and maintain social capital could foster economic development and responsive regional government, which produced 'generalised reciprocity' in which people work for the welfare of others when they feel their actions will be rewarded in the future (Hudson, 1999:184).

Flora et al (1997) and colleagues referred similarly to entrepreneurial social infrastructure (ESI), in communities with a well-developed social infrastructure which engages in entrepreneurial collective action for community improvement. Kahila (2001) addressed the importance of innovation, economic vitality and governance in peripheral regions, attributing failure to achieve economic regeneration in part to poor

governance. Non-geographical factors are increasingly important in peripheral economic development, and communities must take active roles in their own economic development, requiring indigenous innovation and an entrepreneurial culture. The community economic development movement, originating in part from Cape Breton, exemplifies this co-operative-based self and mutual reliance (MacIntyre, 1997; MacLeod et al, 1997). MacLeod's work in community organisation highlighted the potential of access to the 'knowledge economy' by economically disadvantaged communities to create community-based innovative businesses. Entrepreneurship and the start-up, survival and growth of small businesses face multiple disadvantages in peripheral areas (Anderson et al, 2001), but aim to achieve job-generating growth.

Communities of practice and legitimate peripheral participation

 The theme of human capital connects the geographical with the social understandings of peripherality. The work of Lave and Wenger (1991) and Wenger (1998) on communities of practice (CoP) and social learning has been highly influential. Wenger's work on social learning has informed previous conceptualisations of entrepreneurial education and learning (e.g. Rae, 2005; Pittaway & Cope, 2007; Hamilton, 2011), and co-operative and rural community development (Howorth et al, 2012). An important, if less widely recognised dimension of CoP theory, is the concept of 'legitimate peripheral participation' (Wenger, 1998), describing the process by which newcomers become included in a community of practice, moving from the margins towards the centre. The theory is social yet the observations are generalisable: 'The periphery of a practice is thus a region that is neither fully inside nor fully outside, and surrounds the practice with a degree of permeability' (Wenger, 1998: 117).

Wenger's discourse of peripherality is of social rather than geographic remoteness, using geography in a metaphorical sense to explain it. This logic enables a wider definition of peripherality than purely geographic to be applied in the field of social learning and CoP, centring on social learning in conditions of peripherality. This definition of peripherality as a marginal state of being close to boundaries wider than geography may be interpreted in these, and potentially other, ways:

•   Socially: at the margins of participation in a society

•   Economically: at the edges of recognised economic activity, including the informal economy

•   Politically: at the 'fringe', extreme, almost or completely non-participative

•   Ethnically: a member of a small minority, regarded as marginal by the majority groups

•   Intellectually: a lone voice or dissident group with alternative perspectives.

There are other forms of peripherality, including religious and spiritual, gender and sexuality, age and (dis)ability, which may overlap, creating multiple forms of peripherality. Imagine the Burmese Karen woman studying alone in a Western city such as London. She will experience geographic peripherality from her own people, whilst also having other experiences of minority and marginality, such as social, economic, gender, ethnicity, possibly intellectual. In this way, peripherality becomes an inescapable aspect of the human condition, not simply a variable of geographic proximity. However, geographic isolation can magnify any of the other peripheral factors discussed here.

The CoP is a node of engagement which becomes 'looser at the periphery', in which interactions with members from the core to extreme peripherality 'afford multiple and diverse opportunities for learning'. Combining these layers is a source of dynamism: 'the periphery is a very fertile area for change: it is partly outside and in contact with other views; it is partly inside and so perturbations are likely to emerge….the community constantly renegotiates the relations between its core and periphery' (Wenger, 1998: 118). Wenger also proposes the notion of 'the wisdom of peripherality - a view of the community that can be lost

to full participants'. Peripheral wisdom can be invisible and marginalised: 'turning marginalities into peripheral wisdom requires identities that can play with participation and non-participation..taking risks at the margins does not imply exclusion' (Wenger, 1998: 216). Peripheral wisdom is elusive; Wenger refers to it as 'often invisible even to those who hold its potential' being marginalised either or both in terms of competence and experience. Legitimate peripheral participation (LPP), and peripheral wisdom (PW), are adopted in the next section as the methodological lens for exploring entrepreneurial learning in peripheries.

Peripherality, as defined, and its relationship with entrepreneurial learning matters, because entrepreneurship may be considered as an economically marginal activity, as it was traditionally regarded within mainstream economics. The periphery is a zone of disadvantage, hazard and vulnerability where the norm is to work from the periphery towards the mainstream, the centre, as in the notion of legitimate peripheral participation. Learning is an essential process within this journey.

For example, a female Asian entrepreneur in Leicester related that when her husband started a printing business, their aim was to work out of the Asian market and to become recognised in the mainstream business world, where they perceived orders were larger, payment more certain and professional business practices prevailed over informality and kinship (Rae, 2005). Connectivity with 'the centre', is necessary to legitimise the mainstream participation of peripheral entrepreneurial activities, by affording access to investment, market, knowledge, power and other resources which are attracted to centres. However identities and boundaries between peripheries and centres continually change: a periphery may become a centre, and vice versa. The Asian business economy in Leicester was marginal; it is now mainstream.

Wenger's concept of 'peripheral wisdom' suggests that learning insights and opportunities may be available at the periphery, which differ from those at the centre. The connectedness of the relationships and movements between the centre (the normative or mainstream position), and the periphery are critical here. If the periphery is relegated to a secondary role, it becomes marginalised. If, however, the periphery is recognised as a zone of active creativity and learning not available at the centre, it can be legitimised and valued. It is these relationships and movements which provide the connected flow of ideas, knowledge and practices and form the legitimate 'peripheral-central' participation across the boundaries between them.

Research methodology

Research aim

The aim of the study is to explore the relationships between entrepreneurial learning and peripherality through the case study of an innovative learning model in the information & computer technology (ICT) cluster in Cape Breton, Canada. Three related questions derived from this aim are explored:

1.   In what ways is peripherality relevant to entrepreneurial learning?

2.   How can centre-peripheral connectivity enhance this?

3.   What are the implications for communities, learners and educators?

LPP informs both the research questions and the methodology for this study. From the preceding sections, three points shape the study. First, CoP has informed previous work which shows that peripheral experience can be connected with entrepreneurial learning, but we do not understand sufficiently its relevance. Second, it is also apparent that connectivity and movement between peripheries and centres is a recurring theme in the literature which needs better understanding. Third, the practical implications for peripheral communities and their learning and education need to be explored.

Conceptualisation

These three points inform the conceptual map in figure 1. This represents simplistically the relationship between centre and peripheries which draws on the concepts of LPP and PW as theoretical lenses, together with Lackéus' notion of entrepreneurship as shared value creation. A reading of LPP may posit a unidirectional flow from periphery towards the centre, so the question is how these movements of people and forms of knowledge can become bidirectional? A unidirectional flow relegates the periphery to a perpetual role of supplier to the centre. Bidirectional flows of social participation between peripheries and centres mean that peripheries may develop as poles of attraction in their own right and co-create new value through participative relationships and exchanges with centres. The peripheral learning experience provides space for ephemerality, creative ideas and insights, shaped by resourcefulness in a constrained economy and by the peripheral wisdom of the community. The centre provides access through social connections to a range of resources including (not limited to) knowledge, investment, industry and market opportunities, and technology. Operating in a context shaped by location, economic, social, political and cultural factors, learning occurs through two-way connections which create shared value between periphery and centre. Learning is also evident in the practice of peripheral wisdom in facilitating these exchanges.
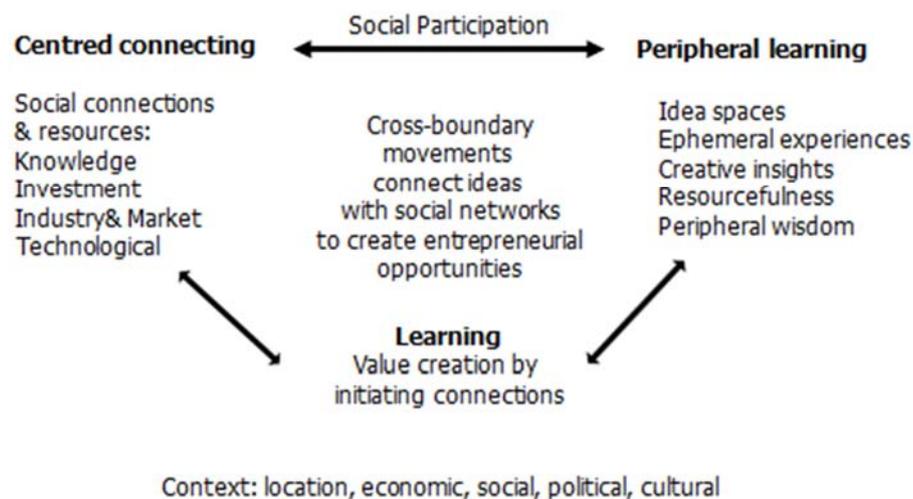

Figure 1: Conceptual map of peripheral-central entrepreneurial learning

Research context

   The context of exploring entrepreneurial learning within knowledge-intensive and technology-based entrepreneurship in peripheral regions accords with the theme of this journal's special issue. Information and Communications Technology (ICT) has for several decades been seen as a medium for reducing the effects of distance and isolation on peripheral communities, especially through using Internet technologies to facilitate direct communications irrespective of time and distance (Fuduric, 2012). The development of ICT-based businesses and sectors in peripheral areas appears to offer potential for the creation of innovative businesses, creating new value, higher skilled employment, and contributing to economic regeneration. This neither a new idea, nor is it easy to implement, its history predating the notion of the 'electronic cottage' and teleworking (Stanworth & Stanworth, 2005). There has been prior work on the economic challenges which knowledge-intensive business services (KIBS) face in peripheral areas, and the extent to which learning, connectivity and social capital can ameliorate these (Benneworth, 2003; Madsen et al, 2003; Irvine &

Anderson, 2008; Crone, 2012). The struggle to develop and sustain an ICT business cluster in a peripheral district is explored in the case.

Data collection and data analysis

A case study is used to explore entrepreneurial learning in relation to peripheral-central connectedness. A case-based approach is an appropriate method to use in relation to the research question, in being able to study the social processes of LPP, providing detailed contextual data on a relevant situation which features both multiple dimensions of peripherality and a KIB sector, as well as being consistent with Wenger's (1998) study. The case material is presented by using the categories from the conceptual map, illustrating the conceptual themes of context; peripheral learning; centred connecting; and cross-boundary social participation.

The case is located in the context of the technology business cluster in Sydney, Cape Breton, Canada and explores the regenerative effect and learning from a new initiative. The researcher worked there in an entrepreneurship development and educational role, and through immersion in this context was able to gather extensive source material for the case over a two-year period. The researcher's stance as participant-observer was consistent with the approach adopted in Wenger's study (1998). The main research sources included direct participation in, and observation of, many meetings and interactions with the network of government officials, business managers, educationalists, community leaders and members who constituted the social and political fabric of the area. Additionally, extensive documentary evidence was given and collected, including commissioned reports on entrepreneurship and economic development, proposals, business plans, and updates on the project. Further public domain source documents and online publications are cited in the case. As an educator/developer, the researcher built social relationships with many people who were learners, entrepreneurs, community activists and others, eliciting their accounts of experience, practice and learning. The documentary and other material was analysed and clustered in relation to the themes derived from the literature which inform the conceptual map in figure 1. These themes were compared reflexively and confirmed for validity with the emergent results of the analysis.

Case study: UIT and the technology cluster in Cape Breton, Canada

Context

The post-industrial district of Cape Breton experienced prolonged decline of its heavy steelmaking industries, accompanied by political conflict and failure to achieve sustainable renewal. This long-term economic decline and attempts to reverse it, offering competing narratives of prospective solutions and claims for community support, were detailed by writers including Johnson & Lionais (2006) and Morgan (2009).

An early response to the socially conflicted industrial era was the development of the Antigonish Movement, led by radical priest-organisers Fathers Coady and Tompkins. This aimed for co-operative organisation through better education of the oppressed workers, resulting in the foundation of a library, the extension college of St Francis Xavier University, which became the University College, later Cape Breton University (CBU). Their work also influenced the Community Economic Development (CED) approach, later advanced by MacIntyre (1997), MacLeod (1997) and MacSween, the latter as President of the New Dawn community organisation which creates social renewal through its Centre for Social Innovation. These approaches, founded on community activism and learning to gain economic empowerment, represent a continuing strand of peripheral wisdom which assists the economic and social survival of marginal communities.

Hopes for the declining industrial economy were kept alive by reopening a coal mine to access reserves under the Atlantic and proposals for a container ship terminal. There is a competing narrative between the

'old industry' and the emergent cluster of newer, ICT based firms, dating from the early 1990's. Georghiou (2014; 2015), a technology entrepreneur, estimated Ca$1 billion was spent on economic development over 20 years with little long-term return. His story of the Cape Breton technology sector chronicles the struggle between vested interests in traditional institutions with innovators. He concluded that bureaucracy, patronage, and the interplay of personal and political agendas have dominated in the absence of enlightened political leadership and a transparent information flow (Georghiou, 2015:41).

Yet there remains a technology cluster of established and stable firms employing 20 or more people, with at least 20 firms known to be active. There are increasing numbers of startups from a low base of new venture creation, and closures. There is a local ecosystem of firms, founders, and investment agencies, which hold a monthly 'TechSocial' networking event. Recently, several tech sector firms have relocated operations to Cape Breton and incomers have started new ventures.

The tech cluster could have been more significant economically, but lacked effective governance and cross-boundary access to investment, people, projects and opportunities enjoyed by firms in metropolitan areas. CBU closed its Bachelor's degree in Technology Information (BTI), the only ICT degree available on the Island, which offered an innovative work placement providing students and employers with a valued knowledge exchange. This meant that young people wishing to gain a computing degree and experience had to migrate. ICT businesses then encountered increasing skills gaps and inability to recruit IT professionals, limiting subsequent direct investment in the Island and job growth.

UIT: innovation in peripheral learning

A successful BTI graduate was Gavin Uhma, who experimented with ICT-based startups before co-founding GoInstant, a shared web-browsing solution which was sold after three years to Salesforce Inc. in a $70m acquisition. GoInstant showed that online innovation, rapid growth, access to capital and industry connections, combined with shrewd entrepreneurial management, could achieve success from a Provincial base. Uhma continued as Salesforce Chief Technology Officer, but also returned to Cape Breton in 2014 to launch a new initiative, UIT (Uhma Institute of Technology: http://uitstartup.org/), aiming to develop founders of tech-start businesses through an experiential program of technology and entrepreneurial skills.

Uhma used his reputation and contacts to gain Provincial and Federal investment, support from industry and CBU, and a base at the New Dawn Centre for Social Innovation:

"UIT teaches technology and entrepreneurship through a project-based, open-source curriculum. The six-month immersion combines self-directed and structured learning, assisted by a network of world-class mentors. UIT students learn code, design, product development, and business skills by building real products, and getting feedback from real users - all leading up to the launch of their own digital product." http://uitstartup.org/#/about

UIT adopted courses from the former BTI program, using experiential and online learning rather than classroom instruction, boasting 'No Books, No Tests, No Professors'; learners certainly preferred the experiential approach following 'Lean Startup' (Ries, 2011) principles.

The first program ran during 2014-15 and recruited 12 students, then repeated in 2015-16. The gender target of equal numbers of male and female participants aimed to redress the historic lower female participation rate in the ICT sector. UIT students worked from a base in New Dawn with 24/7 access and followed a structured learning program of coding from open-source content, technology-based learning, product design and implementation with mentoring which enabled them to launch a minimum viable product (MVP).

The pilot group of UIT participants had diverse backgrounds; several had degrees, one a science PhD, others had varying career experiences in technology, music, media, and other fields. UIT enabled them to relaunch their careers through combining technology entrepreneurship and personal development.

UIT provided an 'idea space' as a 24/7 learning environment, in which participants worked collaboratively on idea conception, technology application, and product development. This provided a productive social space which fostered innovative thinking and activity. It generated social creativity, forming strong interpersonal bonds within the group which generated and experimented with numerous ideas and business applications. Promoted as a unique combination of self-directed and structured learning, feedback from the first two groups showed a need for a more structured learning experience, added for the third year. The first group were highly creative in recognising and trying out new business ideas in the peripheral context, but found translating them to a wider context much harder.

Cross-boundary social participation

UIT drew together a support team of people with industry, technology, mentoring, legal and investment experience, combining local with national and international perspectives. This team undoubtedly contributed to the boundary-spanning capability of the project. Links with the local tech sector became increasingly significant as learners requested access to more regular entrepreneurship mentoring to maintain connections with community leaders and best practices in developing open source curriculum.

The initial focus was on creating startup founders and new companies, but UIT found greater demand for career entries into both startup and established tech sector firms. The approach changed to creating some new firms whilst contributing to innovation and growth in existing firms. The career trajectories of the first group illustrate this. There were four known startups from year one, two being team-starts by duos from the course. Both raised seed funding, hired staff and launched their products but closed after a year for different reasons, having failed to translate the initial promise into startup survival. The founders gained valuable experience and most found jobs in other tech sector businesses almost immediately, confirming the local need for programmers and developers. The self-employment rate from UIT was modest from years 1-2, whilst their ability to find jobs in the tech sector was much higher.

Centred connecting

UIT developed strong connections with leading players in the IT sector, including tech incubators, partnerships, corporates and investor networks. A series of tech-sector startup events held during 2014-16 was attended cumulatively by several hundred people, attracting entrepreneurship and sector leaders with national reputations to stimulate wider interest and ambition in venture creation and innovation. These events spanned traditional boundaries and were significant in building potential entrepreneurs' confidence in developing startup ideas.

UIT altered the peripheral-central dependence relationship by introducing a two-way flow of people, ideas and resources. Unlike previous initiatives, UIT is not reliant on a single level of government or institution. It uses social and industry connections to lever in know-how and investment with a range of corporate and market opportunities, and crucially to 'pivot' and change direction when the strategy is not working. This ability to connect and move with agility between peripheral projects and city-centric resources, networks and opportunities is vital. Uhma used his contacts in the US, Silicon Valley and across Canada to create channels and potential opportunities to which they could not otherwise gain access. The participants were able to learn and gain confidence, making additional connections enabling access to investment channels, partnering opportunities and an enlarged client base.

Learning

The participants gained transformative experiences, developing skills in collaborative innovation. Several became exceptionally articulate communicators, showing potential for future leadership roles. Feedback from the first group of UIT graduates in 2015 included these comments:

'UIT enabled me to learn coding and how to set up my own IT business. More than that, I was able to connect with people in the industry I could never have accessed before.'

'UIT exposed us to new situations and networks, scary at first but built our confidence to succeed in those environments.'

'I knew that my business would have to export to create value but I didn't know how to make those connections before UIT.'

'The emotional blocks to entrepreneurship have been higher and harder to get through than the practical ones.'

'We found an investor and started to build our customer base through the exposure we got from UIT.'

'I was able to translate a music community need I had found into a working App and demonstrate it to potential users and business partners.'

This approach raised aspirations of participants to aim for major opportunities, such as Hackathons and start-up investment pitches, beyond the level of the limited local market. Being formed in the liminal space of New Dawn associated it with the established, self-organised community development movement. It provided a generative thinking and working space for its participants, and spawned a low-cost technology incubator, the Navigate Start-Up House, formed next door to host early-stage ventures. UIT demonstrated that, in a downbeat economic context, a nascent entrepreneurship-technology initiative could start to attract people and support from key centres, re-energise the local tech cluster, and develop a two-way, value-creating flow of talent, knowledge and resources.

The prime learning points from UIT are about the value of creating connective, peripheral-central relationships between entrepreneurs and institutions, which enable the limitations of periphery to be reduced, as much as about the detail of the learning experiences and the modest record of durable start-ups in the first two years. Cape Breton, as a peripheral society, has a discourse of decline in which change initiatives failed to counter long-term trends of depopulation, disinvestment and loss of young talent who saw no future. The relationships with the centres of Canadian economic, business and political power had relegated the island to a supplicant role. UIT symbolically altered that in a small but important way, through increasing two-way social participation centred on entrepreneurial learning, technology innovation, and increasing prospects for value co-creation.

Discussion

The discussion in this section addresses the three questions posed in the introduction.

1. In what ways might peripherality, as defined, be relevant to entrepreneurial learning?

The Cape Breton case is set in a context of geographical, economic, political, cultural and social marginality, providing formative influences for peripheral entrepreneurship. Such contextual factors shape the environment for entrepreneurial learning. Geography is simply one dimension of peripherality, which is also experienced through social, cultural, economic, ethnic and other forms of marginality. Most of the first UIT group experienced factors which afforded them peripheral positions, including gender, youth, adverse family

circumstances, and personal economic marginality. Hence geography compounded their peripherality. This reinforces the notion that peripherality should be recognised and valued as a fundamental part of the human experience, providing alternative insights.

A degree of isolation or marginality can stimulate creative thinking, resourcefulness and innovation. A peripheral context can provide time and space for reflection and for creative thoughts and ideas to emerge from the subconscious mind and connect with external experiences. The peripheral context provides 'idea spaces' which afford time and space for creative association, at both individual and social levels. This may be associated with the neurological concept of 'white matter' in which a brain slowdown of fewer cognitive connections and traffic can enhance personal creativity (Jung et al, 2013). There may be fewer social connections than in an intensive setting, yet these can offer deeper and longer-lasting relationships through intense immersion in a small community. By changing context and moving from centre to periphery, new creative connections are made.

So an awareness of peripherality can provide time and space for creative thinking, for deeper social relationships to develop, and for new creative and social connections through which new learning insights and entrepreneurial discoveries can emerge. In this way, innovations can emerge as 'outliers' rather than as centred production. This is not to say that such connections and creativity do not equally arise in more intensive, centred locations. The distinctive ideas and innovations in the case arose from both its contextual factors as well as from peripheral experiences. However, the experience of separation from the centre allows individuals and co-creators the time and space to work on their ideas, possibly by having fewer distractions and alternative choices than occur at the centre. Also, learning experiences at the periphery may differ from those at the centre by their intensity. In this way, peripherality can be a positive experience in entrepreneurship, by offering insights, innovations and opportunities not available in the same way at a perceived centre.

Entrepreneurship involves both personal and social applied creativity. New ideas and possibilities for shared value creation arise through small-group social encounters, conversations and collaborations (Rae, 2015; Lackéus, 2016). The social connections often shape the idea and are certainly fundamental to its realisation. The ability to use social networks to translate the idea from inception to enaction, connecting peripheral and central contacts and resources, is a fundamental requirement for the entrepreneurial process. In a periphery, there may be fewer social connections available, and those that exist have greater symbolic or actual importance. Hence the ability through cross-boundary social participation to create new social connections is as important as the ability to make neural connections.

The outcome of these social and creative connections is a flow of learning insights. Many are routine, mundane and iterative, but a few more fundamental in generating new meaning or 'discoveries' which alter previous assumptions and working theories. Much of the activity within the UIT group was imitative at one level, in analysing and replicating features and operating systems of existing business applications in the tech space, building on Open Source code. This routine learning provides the underlying capability for occasional acts of innovation and discovery, in which an original business concept, model, product or application is created, as several of the UIT group demonstrated.

2. How can centre-peripheral connectivity enhance this?

Peripherality can be a positive factor in entrepreneurial learning, responding to the relegation of peripheral areas and people away from 'the centre'. Some entrepreneurial people prefer the freedom to operate peripherally. The contribution of Lave and Wenger (1991) is informative in its conceptualisation of legitimate peripheral participation in social learning. It was evident from studying the entrepreneurial network in the case context, that the most effective actors sensed the need to generate bi-directional flows, and acted to facilitate 'two-way traffic' of people, ideas and resources, between centres and periphery, making Cape Breton a uniquely differentiated focal point. This understanding and the related social intelligence, perseverance and skills involved in enacting it, was a recurrent example of peripheral wisdom in practice. Not all those who appreciated and attempted this were successful. Very well established and

maintained social capital and relational networks, at business, political, academic, cultural and expert levels, were required to facilitate these two-way flows.

Hence it is evident that peripheral entrepreneurship and innovation cannot remain at the periphery and thrive. They require multiple connections and mobility with centred institutions, as partners, experts, investors and customers, if they are to develop. Using and creating social connections with such centres is essential in exchanging, developing and marketising ideas from the periphery. In this way, peripheral communities of entrepreneurs can potentially work as creative producers and resources to create shared value with centres. Peripheral entrepreneurship can benefit communities by stimulating people and knowledge flows, bringing change, innovation and regeneration and, perhaps most important, hope.

3. What are the implications for communities, learners and educators?

These groups can all benefit by recognising that peripherality affords different perspectives, insights and creative ideas from the mainstream, and that there are differing forms of peripherality beyond the geographic. Making available and using 'idea spaces' to enable open collaborations by learners in entrepreneurial projects can facilitate this. Two-way flows between peripheral groups and centres should be recognised as vital for creating shared value across these boundaries and enhancing the capacity and confidence of peripheral producers. Communities and educators can organise and support events, networks and initiatives, such as Hackathons where multi-site teams collaborate remotely. One focus can be on the development of IT applications to bridge peripheral-central boundaries.

Educators and learners should recognise and develop the bridging skills they require to work between centres and periphery, and to expand their social and professional networks and relationships with both centres and peripheries. Learning involves participation and practice, hence direct, real, live exchanges and trust-building need to take place across the boundaries.

Both the case and prior work suggest that entrepreneurship, and increasingly technology and knowledge-intensive activities are essential to the regeneration of peripheral areas. It is also clear that such activities face multiple challenges, high rates of failure and often smaller economic rewards than at the centre. Knowledge-intensive and technology-based innovation and entrepreneurship require effective conditions of supportive institutional governance as well as active knowledge exchange networks, and access to resources of expertise, finance, market opportunities and so on. These were only present in limited form in the case study. Boundary-spanning leadership is required to develop and provide these social conditions for peripheral entrepreneurship.

Conclusions

The conclusion summarises the findings, building on prior understanding by Wenger (1998) of legitimate peripheral participation as a social learning process; entrepreneurial learning as active, personal and transformational (Rae, 2015); and entrepreneurship as shared value creation through learning (Lackéus, 2016).

Defining peripherality beyond simple geographic marginality makes a categorical difference in social and cultural terms. Everyone, at some period in their life, will experience a form of such peripherality. Being and learning in a peripheral context should be valued for the new insights it can bring, as a positive and normal aspect of the human experience, rather than as marginal and unimportant. The peripheral context can provide thinking and creative spaces which engender moments of deep transformative learning and ephemeral insights. There may be fewer, deeper social relationships at the periphery, which allow greater intensity of learning experiences. If the periphery is recognised as affording a zone of active creativity and learning different from a centre, it can be legitimised and valued as such. The question is then of how people connect across peripheral-central boundaries to create new, shared value.

Community organisation and social capital are influences in creating a conducive environment in which there are relationships, places, events and processes to support learning and social participation. Social

connections both shape an idea and are fundamental to its realisation. Learning is experienced in overcoming the apparent disadvantages of distance and disconnections. Entrepreneurial learning at the periphery is social and experiential, exploratory in responding to perceived opportunities by creating transpersonal, collaborative innovations which emerge as outliers. It is also situational and contextual. Knowledge-intensive enterprise is an expert domain in which peripherality may be a disadvantage, for which ICT-sourced innovation can address and compensate.

However, whilst ideas and opportunities can be generated and recognised at the periphery, they are harder to translate into sustainable businesses. This applies to knowledge-based industries at least as much as any other context. Developing strong central-peripheral connections is fundamental for effectiveness, since learning is, above all, learning to connect. These connective relationships and movements fuel the learning flow of ideas, knowledge and practices which forms the legitimate 'peripheral-central' cross-boundary participation.

Learners must engage their peripheral experiences and ideas with the social networks, academic, industry knowledge, technology resources and political influences in the mainstream to reach beyond a marginal role. Developing the social confidence, networks of contacts, persistence and sensing skills to facilitate bi-directional flows are both aspects of peripheral wisdom and essential entrepreneurial learning outcomes for both educators and learners. These can only be developed experientially, by immersion and practice. If we recognise entrepreneurship as a learning process of shared value creation (following Lackéus, 2016), then developing such skills and personal attributes are integral to its practice in peripheral learning.

At a policy level, there should be recognition not only of the distinctive needs and challenges of peripheral areas and groups, but also of their creative and developmental potential. Small risks can be taken in supporting innovative learning interventions, such as UIT, which for a modest investment can both transform opportunities in the periphery whilst developing a two-way flow of ideas and people to enrich both periphery and centre. At a practical level, learners, entrepreneurs and intermediaries can enhance their social capital and effectiveness by developing bridging skills and behaviours to work across centre-periphery boundaries. The design of cross-boundary learning interventions, including use of technology, can support this.

This exploratory study has limitations which result from its single case being situated in a specific local and temporal context; this does not facilitate comparison and limits the insights gained. There is scope for further, grounded research into transformative entrepreneurial learning with peripheral groups which could benefit from comparisons between different settings, including not only geographical but also cultural, ethnic and other forms of peripheral experience. A formal research design, including a dataset to enable comparisons using the constructs proposed as a starting point, could provide more definitive insights into the characteristics and processes of peripheral entrepreneurial learning.

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