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Situated learning in a business incubator: Encouraging students to become real entrepreneurs

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Situated Learning in a Business Incubator: Encouraging Students to become Real Entrepreneurs

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Abstract:	<p>The options for conventional graduate careers have become more limited in the last twenty years. This has stimulated an increase in university programmes and modules designed to encourage students to start their own businesses. The recent global pandemic associated with Covid-19 is likely to make the job market even more difficult for those graduating from universities in the next few years. A career as an entrepreneur is a realistic alternative to employment in the 'gig' economy for many young graduates. University-based incubators (UBIs) can provide a sheltered learning environment for those wishing to develop business ideas without incurring a large financial burden. In this paper, we draw on a range of literature (business incubation, entrepreneurial learning, human capital and communities of practice) to develop a model of a university-based incubator that will support young people in their transition to becoming real entrepreneurs.</p>

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10 **Situated learning in a business incubator:**
11 **Encouraging students to become real entrepreneurs**
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38 **Abstract:**

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40 The options for conventional graduate careers have become more limited in the last twenty
41 years. This has stimulated an increase in university programmes and modules designed to
42 encourage students to start their own businesses. The recent global Covid-19 pandemic is
43 likely to make the job market even more difficult for those graduating from universities in the
44 next few years. A career as an entrepreneur is a realistic alternative to employment in the
45 'gig' economy for many young graduates. University-based incubators can provide a
46 sheltered learning environment for those wishing to develop business ideas without incurring
47 a large financial burden. In this paper, the authors draw on a range of literature (business
48 incubation, entrepreneurial learning, human capital and communities of practice) to develop a
49 model of a university-based incubator that will support young people in their transition to
50 becoming real entrepreneurs.
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56 **Keywords:**

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58 entrepreneurial learning, communities of practice, incubation, university-based incubators,
59 student enterprise
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3 An increasingly important element of any entrepreneurial university is a strong commitment to
4 enterprise education (Pittaway and Cope 2007; Jones *et al.*, 2019; Kariv *et al.*, 2019) and
5 support of graduate entrepreneurship through the provision of incubation facilities (McAdam
6 and Marlow 2008). According to Patton *et al.* (2009), the UK government introduced the
7 Higher Education Innovation Fund (HEIF) to promote the knowledge economy by building
8 better links between universities and business. The authors go on to state:
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17 ‘The HEIF fund has been made available to universities to develop their potential
18 as drivers of future economic growth and the monies have been used by universities
19 to finance, among other things, their business liaison and technology transfer
20 offices, and to support spinouts and other business ventures often through the
21 introduction of incubation facilities.’ (Patton *et al.*, 2009: 622)
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24 Analysis by the Department of Business, Energy and Industrial Strategy indicates that,
25 currently, there are over 130 incubators and accelerators operated by UK universities.¹ At the
26 same time as the development of university-based incubators (UBIs), there was a concomitant
27 increase in entrepreneurship courses aimed at undergraduate and postgraduate students
28 (Herrmann *et al.*, 2008). Pittaway and Cope (2007) suggest a number of topics in enterprise
29 education that have received a considerable amount of academic attention, such as student
30 orientation to entrepreneurship and the most appropriate teaching approaches. At the same
31 time, there are gaps related to the impact of enterprise education students who do start their
32 own businesses (Pittaway and Cope, 2007). Gibb (2011), a long-term champion of enterprise
33 education, stressed the need to reject traditional learning modes in favour of immersing
34 students in entrepreneurial activities (Gibb, 1997). Lourenco and Jones (2006) describe the
35 importance of an approach to enterprise education based on active learning techniques such as
36 role-play, fieldtrips and scenario planning alongside conventional classroom pedagogy (Kariv
37 *et al.*, 2019; Matlay, 2005; 2006; 2009; Sörensson and Bogren, 2020).
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58 ¹ <https://www.gov.uk/government/publications/business-incubators-and-accelerators-the-national-picture>
59 (accessed September, 2020).
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3 Most recent UK graduates engaged in business start-up have several disadvantages,
4 including substantial financial liabilities associated with their studies. For example, those who
5 graduated from English universities in 2020 will have average loan debts of more than £40,000²
6 compared to £24,960 in Wales, £23,520 in Northern Ireland and £13,890 in Scotland.³
7
8 Networks of undergraduate students are generally concentrated on family and friends; they lack
9 credibility with resource providers and have limited business experience (Edelman *et al.*, 2016;
10 Klyver, 2007; Manolova *et al.*, 2019). Battisti and McAdam (2012) confirm that family and
11 friends are the most important resource-providers for graduate entrepreneurs in UBIs (Eveleens
12 *et al.*, 2017). Also, as pointed out by Jones *et al.* (2019: 186), ‘the literature suggests that
13 university graduates are poorly equipped for future business activity (Pittaway and Cope, 2007;
14 Premand *et al.*, 2016)’. Therefore, university-based incubators are important for recent
15 graduates because they provide a supportive environment in which inexperienced incubatees
16 can improve their entrepreneurial skills while developing feasible business ideas (Voisey *et al.*,
17 2013).

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19 Incubation provides an ideal opportunity for learning-by-doing, as well as social
20 learning through engaging with others who are involved in the start-up process (Taylor and
21 Thorpe, 2004). Becoming part of a ‘community of practice’ (Lave and Wenger 1991) helps
22 nascent entrepreneurs acquire new knowledge as they engage in active learning (Refai and
23 Klapper, 2016). Incubation provides access to key knowledge brokers, such as the incubation
24 manager who can link young and inexperienced entrepreneurs to those with greater experience,
25 as well as potential resource providers in the form of larger companies, business angels and,
26 eventually, venture capitalists (McAdam *et al.*, 2016; Van Weele *et al.*, 2018).

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² <https://researchbriefings.files.parliament.uk/documents/SN01079/SN01079.pdf> (accessed December 2020).

³ <https://www.statista.com/statistics/376423/uk-student-loan-debt/> (accessed December 2020).

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3 Our objective in this paper is to examine a wide range of literature covering business
4 incubation, entrepreneurial learning, prior knowledge, human capital and communities of
5 practice to develop a model of a UBI.
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10 11 **Research Approach** 12

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15 In an editorial for the *International Journal of Management Reviews (IJMR)*, Jones and Gatrell
16 (2014) discuss the increasing prevalence of ‘systematic’ literature reviews. The authors build
17 on work by Rousseau *et al.* (2008), who distinguish between traditional narrative literature
18 reviews and systematic research syntheses. Most literature reviews published in leading
19 journals such as *IJMR* are now based on the systematic approach as described by Tranfield *et*
20 *al.* (2003) because editors (and reviewers) demand high levels of transparency, rigour and
21 objectivity (Denyer and Transfield, 2009). As we explain below, our review of the literature
22 was based on a mixture of the traditional and systematic approaches.
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34 The genesis of this paper was a PhD focusing on entrepreneurial learning in a UBI
35 (Meckel, 2014). As with most doctoral students, Meckel adopted an approach known as the
36 ‘traditional narrative review’, which uses informal mechanisms for organizing and analysing
37 the literature (Hammersley 2001). In developing this paper, we began by examining literature
38 related to five core concepts identified by Meckel (2014): UBIs, entrepreneurial learning,
39 communities of practice, prior knowledge and human capital. The original material was then
40 extended by searching the literature⁴ systematically without adopting all the principles of a
41 systematic literature review (Tranfield *et al.*, 2003). Initially, we searched the EBSCO Business
42 Source Premier database for work published in refereed journals using each of the five concepts
43 mentioned above. Based on titles and keywords, we read the abstracts to establish the extent to
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59 ⁴ Between March and December 2020.
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3 which each paper linked to our core themes of learning in UBIs. We also scanned the
4 bibliographies of the most recent papers to identify publications that had not been found in our
5 original searches. As Jones and Gatrell (2014: 257) point out, ‘there will always be a place for
6 narrative reviews as long as authors are able to demonstrate a real contribution to knowledge’.
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8 Our contribution to knowledge is to bring together a range of concepts from the literature to
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10 develop a realistic model of a student entrepreneur learning community of practice (Figure 1).
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17 **Figure 1 about here**

18 **University-based incubation**

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22 There is an extensive literature dealing with the performance of business incubators (Albort-
23 Morant and Ribeiro-Soriano, 2016; Bergek and Norrman, 2008; Blok *et al.*, 2017; Bone *et al.*,
24 2017; 2019; Buckley and Davis, 2018; Lukeš *et al.*, 2019; Mian *et al.*, 2016; Sedita *et al.*, 2019).
25
26 Hackett and Dilts (2004) claim that the first business incubator was established in the USA in
27 1959. Publication of Temali and Campbell’s (1984) study stimulated interest from the
28 academic community. According to Theodorakopoulos *et al.* (2014: 606) there have been three
29 generations of business incubation. The first generation (1980–1990) concentrated on
30 affordable space and shared facilities; the second (1991–2000) added various support services
31 including business advice and networking; and the third (2001 onwards) introduced
32 mentoring/coaching, business acceleration and network development to the first- and second-
33 generation provisions. In one of the earliest studies, Brooks (1986) suggested that successful
34 incubators needed to have a close, formalised relationship with universities. Allen and
35 McCluskey (1990) identified four distinct types of incubator: for-profit property development,
36 non-profit development corporation incubators, academic incubators and for-profit seed capital
37 incubators. More recently, Ng *et al.* (2019) argued that, in many cases, incubators had a range
38 of objectives and they identified a new category described as a ‘hybrid incubator’. In a
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3 comprehensive review of the literature, Mian *et al.* (2016) claimed that research on business
4 incubation had intensified since the beginning of the 21st century. Therefore, in this review we
5 intend to concentrate on literature focusing specifically on UBIs. We believe that this emphasis
6 is necessary because UBIs are likely to differ substantially from conventional for-profit
7 incubators.
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15 UBIs provide tenants with two main services: first, office space, business support and
16 training; second, access to new technologies and credibility with various stakeholders
17 (Redondo and Camerero, 2019a). The authors distinguish between three elements of the
18 incubation process: pre-incubation (business planning and training), incubation
19 (coaching/mentoring, advanced business planning and commercialisation) and post-incubation
20 (internationalisation support, business development etc). According to Nabi and Holden
21 (2008), graduate entrepreneurs are university students who pursue venture creation or self-
22 employment as a career path pre- or post-graduation (see Battisti and McAdam, 2012). A
23 number of writers propose that university technology business incubators (UTBIs) are critical
24 support mechanisms for encouraging the growth and development of early-stage high-
25 technology firms (Fang *et al.*, 2010; McAdam and McAdam, 2008; Nicholls-Nixon and
26 Valliere, 2020; Wonglimpiyarat, 2016). In contrast, Patton and Marlow (2011) claim that there
27 is no academic consensus on the contribution incubators make to the performance of new
28 ventures (Aernoudt, 2004; NESTA, 2008).
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47 Based on a sample of US universities, Lasrado *et al.* (2016) contacted over 600
48 graduated firms and created a matched sample of firms from non-university incubators. They
49 established that there was a greater rate of increase in jobs and sales over time for university
50 incubated firms than non-university incubated firms (*cf* Ensley and Hmieleski, 2005). The
51 main benefits of belonging to a UBI included greater connectivity to their community of
52 stakeholders and more legitimacy with larger businesses (Lasrado *et al.*, 2016: 217). In their
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3 study of a Welsh University ‘pre-incubator’, Voisey *et al.* (2013) selected 26 businesses that
4 had graduated between 2001 and 2011. The results confirmed that pre-incubation facilities
5 provided would-be entrepreneurs with the support to test new ideas while developing their
6 business skills (Voisey *et al.*, 2013). Significantly, the authors emphasise the key role played
7 by UBIs in times of economic recession and high graduate unemployment. In an earlier study,
8 Voisey *et al.* (2006) also found that UBIs improved business skills, interpersonal skills and
9 enhanced peer-to-peer networking (Cooper *et al.*, 2012; Culkin, 2014; Jones *et al.*, 2014).

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Nahapiet and Ghoshal’s (1998) three dimensions of social capital (structural, relational and cognitive) were used to analyse the activities of graduate entrepreneurs in a UBI (Battisti and McAdam, 2012). The study compared two graduate entrepreneurs and two experienced academic entrepreneurs based in an Austrian Science Incubator. The graduate entrepreneurs continued to rely on their strong ties (Granovetter, 1973), comprising family and friends, throughout the two years of the study. In contrast, the academic entrepreneurs were able to mobilise a more heterogeneous network of relationships (Battisti and McAdam, 2012). Reliance on strong ties meant that the younger entrepreneurs were less equipped to access a wider range of resources (Lee and Jones, 2008). Interviews with 25 graduate entrepreneurs and analysis of their business plans revealed four types of relational capital during new venture formation: development of networks, relationship building, accessing and leveraging knowledge experts and members of associations (Gately and Cunningham, 2014). While McAdam and Marlow (2007) confirmed the benefits of UBIs for young entrepreneurs they also identified risks for those whose business ideas were based on proprietary scientific knowledge. Confidentiality was an increasingly issue as business ideas matured and entrepreneurs did not want to be based near to similar businesses (McAdam and Marlow, 2007).

Soetanto and Jack (2016) examined the long-term impact of UBIs on growing firms in the UK, the Netherlands and Norway. Strong network ties (academic staff and business) had a

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3 positive impact on the performance of spin-offs. Díez-Vial and Montoro-Sánchez (2016)
4 examined the relationship between knowledge exchange and innovation amongst firms based
5 on Madrid Science Park (linked to the Autonomous University of Madrid). Those firms
6 centrally located within their knowledge networks also had higher levels of innovation (Díez-
7 Vial and Montoro-Sánchez, 2016; Ng *et al.*, 2019). In their study, McAdam *et al.* (2016)
8 established that effective UBIs were embedded in regional ecosystems bringing together
9 industrial partners, R&D laboratories, banks and investors such as business angels (Etzkowitz,
10 1998; 2003; Carayannis and Rakhmatullin, 2014).

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22 Having introduced the topic of university-based incubation, in the next section we
23 examine the crucial role played by incubator managers or management teams in creating the
24 appropriate conditions for a learning community of practice to emerge amongst incubatees.
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31 **Managing UBIs**

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34 It is widely acknowledged that the incubation manager (IM) is central to the success of business
35 incubators (Culkin, 2014; Kakabadse *et al.*, 2020; Mian, 2014; Patton and Marlow, 2011;
36 Theodorakopoulos *et al.*, 2014). Nevertheless, IMs must work within the existing ‘institutional
37 logics’ if they are to provide an integrated service to their tenants (Redondo and Camerero,
38 2017). IMs should adopt a brokerage role by building links with potential customers, funders
39 and more experienced business people. Managers responsible for eight UBIs in Portugal were
40 interviewed by Carvalho and Galina (2015). Their findings indicated that the management
41 teams’ ability to offer softer services such as networking and business skills were more
42 important to the start-up and growth of entrepreneurial firms than harder factors such as the
43 incubator infrastructure (Carvalho and Galina, 2015: 264). At the same time, incubatees must
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3 be willing to develop a working relationship with the IM if they are to make a success of their
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5 time in the UBI (Ahmad and Ingle, 2011).
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8 Ahmad and Thornberry (2018) examined the roles of management teams in two very
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10 different incubators based in Dublin. The management team of IncWorks (a university-based
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12 high-tech incubator) had detailed targets related to the number of spinouts, the number of new
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14 clients, the number of feasibility grants and the amount of seed funding/capital obtained by
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16 their clients. It was not clear, however, whether underperformance was sanctioned and the
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18 authors conclude that the 'IM's true role remained largely uncontrolled and unmonitored'
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20 (Ahmad and Thornberry, 2018: 1203). In contrast, in DubInc (a Community Enterprise Centre)
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22 there was a clear separation between the manager's formal role of achieving monthly revenue
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24 targets and their informal role as coach and mentor. The *DubInc* IM was also expected to
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26 maintain good relations with the local community to support the creation of a strong enterprise
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28 culture.
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33 Redondo and Camarero (2019a) draw on their extensive study of incubators based in
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35 the Netherlands and Spain to argue that those with experience of both business and science are
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37 best suited to running university incubators. Incubators offering the widest range of services
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39 had the highest occupancy rates and the highest number of firms successfully graduating to the
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41 next stage. Using incubatee data from the same study of incubators in Spain and the
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43 Netherlands, Redondo and Camarero (2019b) examine the IM's role in developing social
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45 capital in UBIs. The results indicated that the creation of relational social capital, based on trust
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47 and reciprocity, between incubatees depended on the IMs taking an active role. Those IMs who
48
49 adopted a 'brokerage role' were responsible for establishing bridging social capital, which
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51 enabled incubatees to build external business networks (see Culkin, 2014). Bridging social
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53 capital is particularly important because it 'has a significant influence on the efficiency of
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3 incubatees' business in terms of business planning, implementation and management'
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5 (Redondo and Camarero, 2019b: 619).
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9 In their recent study, Kakabadse *et al.* (2020) examine the role and performance of IMs
10 based on 40 interviews in incubation centres across the UK. Confirming the findings of
11 Redondo and Camarero (2019b), they found that IMs had an important role in terms of creating
12 bridging and bonding social capital. According to Kakabadse *et al.* (2020), IMs saw their
13 primary function as acting as mentor to incubatees and being a catalyst for new business ideas.
14 The IMs acknowledged the need to meet institutional targets for occupancy and graduation
15 rates while stressing the need for flexibility in their jobs so that they could also focus on
16 innovation and job creation. Lack of funding, resources, time and too much 'red-tape' were the
17 main constraints on IMs' ability to meet their targets (Kakabadse *et al.*, 2020: 490). In terms
18 of balancing their responsibilities to the institution and to incubatees, IMs' roles were
19 concentrated on prioritising, delegating, managing expectations and maintaining a working
20 relationship with incubatees. In general, IMs felt that too much focus on targets prevented them
21 from achieving their main goal of providing incubatee support. Hence, IMs should ensure that
22 performance indicators and compliance requirements align with incubatees' support needs
23 (Kakabadse *et al.*, 2020: 11).
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43 Other scholars confirm that those IMs who provide business support and access to
44 networks are likely to have lower failure rates amongst incubatees (Bergek and Norrman,
45 2008). Nair and Blomquist (2019) carried out 56 in-depth interviews with IMs/business
46 coaches and entrepreneurs in nine Swedish incubators (including three UBIs). They claim that
47 IMs should concentrate on selecting the best team rather than on the business idea in the early
48 stages of incubation. Encouraging stakeholder involvement is essential as teams seek validation
49 of their business models. This stage is followed by development of the business model and a
50 search for funding and professional or technical expertise (Nair and Bomquist, 2019). As
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3 businesses exit the incubator, then the focus of the management team switches to building a
4 scalable business model (DeSantola and Gulati, 2015). Galvão *et al.* (2019) also focus on
5 networks in their study of entrepreneurs based in Portuguese incubators. IMs provided formal
6 links to external institutions, which supplemented the entrepreneurs' informal social networks.
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8 These more strategic networks, initiated by IMs, enabled entrepreneurs to access to external
9 funding and knowledge as well as gaining experience of negotiating with weak ties (Galvão *et*
10 *al.*, 2019; Sullivan *et al.*, 2020).
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19 Having established the role of incubation managers in the operation of UBIs, we turn
20 our attention to incubatees during their tenancy in an incubator. The importance of experiential
21 learning in the creation of a community of practice during the incubation process is widely
22 acknowledged in the literature.
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31 **Entrepreneurs and Learning Communities**

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33 Lamont (1972) was one of the first authors to recognise the importance of entrepreneurial
34 learning, and in the last 20 years 'learning' has become a central feature of entrepreneurship
35 research (Hyams-Ssekasi and Caldwell, 2018; Toutain *et al.*, 2017). The seminal work of Jason
36 Cope certainly contributed to a rapid growth in research on the role of experiential learning in
37 enhancing entrepreneurship skills (Cope 2003; 2005; 2011; Cope *et al.*, 2007; Pittaway and
38 Thorpe, 2012). Cope and Watts's (2000) paper is certainly seminal in the academic literature
39 dealing with entrepreneurial learning (to date⁵ it has attracted more than 1250 Google Scholar
40 citations). Experiential learning theory provides a useful framework for studying
41 entrepreneurship in the context of a business incubator (Corbett, 2005). First, opportunity
42 identification and development occur when prior knowledge provides the basis for the creation
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3 of new knowledge (in this context, an idea) by engaging in the development process (Smith *et*
4 *al.*, 2019). Second, both prior knowledge and newly acquired information, where knowledge
5 (or business ideas) is created and re-created, can lead to the identification and development of
6 opportunities (Schmitt *et al.*, 2018). The framework developed by Smith *et al.* (2019) connects
7 the person with the opportunity (knowledge, information and experience of transformation)
8 and emphasises the interplay between the three concepts. Experiential learning theory (ELT)
9 also stresses the importance of the *process* of transformation, rather than content or outcomes
10 (Pittaway and Cope, 2007).
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21 Refai and Klapper (2016: 487) draw on Fayolle's (2013) work (what, how and where)
22 adding four 'aspects of experiential learning for enterprise education' (AELEE) to extend the
23 Kolb learning cycle. These four elements – tactics, learning environment, role behaviour and
24 the institutional context – shape the nature of experiential learning. 'Tactics' refers to the ways
25 lecturers engage students by introducing, for example, case studies or experienced
26 entrepreneurs. The 'learning environment' concerns 'spaces' where instruction takes place,
27 such as conventional classrooms or laboratories/workshops, which encourage more active
28 forms of learning. 'Role behaviour' focuses on the approach adopted by lecturers, which may
29 vary from traditional pedagogy to a more facilitative role designed to encourage learner
30 engagement. Finally, the 'institutional context' draws attention to the department (Business
31 School), the university and the regional ecosystem in which learning takes place (Refai and
32 Klapper, 2016: 496). The last aspect is of direct relevance to the ways in which inexperienced
33 entrepreneurs engage with the incubator learning process discussed below.
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51 Situated learning theory indicates that learning takes place in communities of practice
52 amongst groups of people engaged in a common enterprise (Theodorakopoulos *et al.*, 2014).
53 The 'community of practice' approach is based on three key elements: a domain of knowledge,
54 a community and its shared practices (Wenger, 2000; 2009). Situated learning, which occurs
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3 both formally and informally, stresses the importance of legitimate peripheral participation
4 (Lave and Wenger, 1991). This is the processes by which newcomers are able to join and
5 engage in an established learning community such as a UBI. Thus, the primary sensemaking
6 distinction concerns whether research is focused on developing individual knowledge and skills
7 or recognition that learning is influenced by the context of experiences, problem-solving and
8 networks in which nascent entrepreneurs are embedded (see Berends *et al.*, 2016). Developed
9 from the theory of situated learning (Lave and Wenger 1991), Wenger (1998) sees learning as
10 social participation and identifies four elements of learning: identity (learning as becoming),
11 meaning (learning as experience), practice (learning as doing) and community (learning as
12 belonging). These elements suggest that individuals learn not only from self-critical reflection
13 but also by interacting with their environments through relationships in the community
14 (Klapper and Refai, 2015; Lans *et al.*, 2008).

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31 Kolb and Kolb (2005) developed the concept of learning space and highlight its
32 importance in enhancing experiential learning. They draw the social concept of learning from
33 the ecology of human development (Bronfenbrenner 1979; 1977), situated learning theory
34 (Lave and Wenger 1991) and the theory of knowledge creation (Nonaka and Konno 1998).
35 Kolb and Kolb (2005) suggest that individuals can adapt their styles of learning to different
36 contexts. When nascent entrepreneurs interact with a dynamic environment, they need to
37 transform from individuals with business ideas into entrepreneurs with viable ventures. The
38 concept of *Ba* (Nonaka and Konno, 1998; Nonaka and Toyama, 2015) is combined with the
39 idea of an ‘enabling context’ (Rennemo and Åsvoll, 2019:3) to stress ways in which dialogue
40 between entrepreneurs creates new knowledge. Rennemo and Åsvoll (2019) go on to argue that
41 trust between members of the community and ‘professional facilitation’ are central to the
42 promotion of meaningful dialogues.
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Several commentators maintain that entrepreneurship and learning do not take place in isolation; rather, they are part of a social process and all knowledge is socially constructed (Cope 2005; Cope and Watts 2000; Pittaway and Cope 2007; Rae and Carswell 2001; Rae 2005; 2015; Theodorakopoulos *et al.*, 2014; Wenger 1998). Using a narrative approach, Rae (2005) develops a conceptual model of entrepreneurial learning which consists of three main components and eleven subcomponents. Personal and social emergence, negotiated enterprise and contextual learning are the three main components. According to Pittaway and Cope (2007: 213), entrepreneurs can be described as ‘practitioners who operate in social communities of practice’. This view is based on the idea that entrepreneurs take a proactive role in identifying, developing and exploiting opportunities through self-reflections as well as social interaction. Kolb and colleagues (Baker *et al.*, 2005) also extend experiential learning theory by suggesting that conversations help groups of learners construct new meaning and transform their collective experiences into knowledge and knowing. More recently, Politis *et al.* (2019) have confirmed the links between experiential learning and collective learning based on a study of entrepreneurs in a venture accelerator programme.

In understanding the nature of learning in a UBI, it is important to recognise the significance of both human capital and prior knowledge. Human capital is generally measured by an individual’s formal educational achievements. While prior knowledge can be linked to qualifications, it can also be acquired informally through observation of potential gaps in the market or inadequate services provided by existing organisations.

Prior Knowledge and Human Capital

Those entering a UBI will come from a range of different educational backgrounds. No doubt some will have taken degrees or modules related to entrepreneurship and business start-up,

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3 while others may have been stimulated to start their own business by a family background in
4 business ownership (Jones and Giordano, 2020) or by the desire to pursue a personal interest
5 (Ardichvili *et al.*, 2003). Effectuation theory stresses the importance of nascent entrepreneurs
6 making the best possible use of the resources at their disposal (Read *et al.*, 2016; Sarasvathy,
7 2001; 2012). In the case of students thinking about starting a new business, such resources are
8 likely to be extremely limited. Hence, it is important that they develop the knowledge to
9 identify and evaluate those resources in which to invest (Sullivan *et al.*, 2020). As pointed out
10 by Rae and Carswell (2001), tacit knowledge is important for nascent entrepreneurs who want
11 to create a distinctive business model. Initially, internal knowledge resides largely with the
12 individual entrepreneur and is central to opportunity creation. As the business develops,
13 externally sourced knowledge in the form of partnerships with key stakeholders is important
14 for enhancing the firm's resource capabilities (Jenssen and Koenig 2002). The knowledge
15 resources necessary for entrepreneurs include an understanding of the processes involved in
16 business creation, people management, business growth, new technologies and new product
17 development (Brush *et al.* 2001). Successful pursuit of these activities depends on an
18 entrepreneur's understanding of the type and configuration of resources necessary to develop
19 a particular opportunity. Wiklund and Shepherd (2003) identified three types of procedural
20 knowledge important to new venture founders: knowledge about the industry, knowledge about
21 the type of business, and knowledge about starting-up new ventures. A wealth of experience-
22 based knowledge, developed over time, exerts a central and often pivotal influence on the
23 entrepreneur's ability to engage effectively in opportunity recognition and the exploitation of
24 new ideas (Hansen *et al.*, 2011).

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26 For most students with limited exposure to the business world, personal interests will
27 be related to knowledge acquired through part-time work, family relationships and daily life
28 (Venkataraman 1997). Pre-existing networks consisting of family members, close friends and
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3 associates are essential for young entrepreneurs as well as the ability to bridge into new
4 networks (Lee and Jones, 2008). In their study of high-tech start-ups, Sullivan *et al.* (2020)
5 established that weak ties were extremely important for learning about customer requirements.
6
7 Clearly, the size and density of existing social networks (Elfring and Hulsink 2003; 2008) must
8 be combined with the skills to create resource opportunities by extending their networks (Lee
9 and Jones 2008). George *et al.* (2016: 332) point out that literature related to prior knowledge
10 is ‘heterogeneous’ and summarise their findings in the following manner: ‘Research is oriented
11 mostly toward finding appropriate contingencies in which prior knowledge can be an
12 influencing factor for recognizing opportunities.’ Early work applied human capital theory to
13 discuss the impact of prior knowledge on opportunity recognition (Ardichvili *et al.*, 2003). That
14 work was followed by studies concerned with specific dimensions of prior knowledge arising
15 from the knowledge-based perspective (Hill and Birkinshaw, 2010; Marvel and Droege, 2010).
16 Others have applied learning theories to examine how teaching curricula enhance opportunity
17 recognition (Kourilsky and Esfandiari 1997) and how learning asymmetries influence
18 opportunity recognition (Corbett 2007).
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37 Drawing on ‘25 start-up stories’ collected by the Kauffman Foundation, Smith *et al.*
38 (2019) carried out qualitative comparative analysis (QCA) to identify links between prior
39 knowledge and opportunity discovery/creation (Tocher *et al.*, 2015). Nine entrepreneurs used
40 a ‘creation approach’ and all benefited from a committed circle of friends and family to provide
41 knowledge and information related to the opportunity. Social capital (Jack, 2005; Taylor *et al.*,
42 2004) was also important to the sixteen entrepreneurs who adopted a discovery approach for
43 the identification of new opportunities (Shane, 2000; 2003). However, the key difference was
44 that the ‘discovery’ entrepreneurs made much greater use of ‘social bridges’ to access a wider
45 range of knowledge and information. As summarised by the authors: ‘Specifically, results
46 suggest that entrepreneurs may rely on social capital and prior knowledge and experiences in
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3 different ways, depending on the type of opportunity associated with their venture.’ (Smith *et*
4 *al.*, 2019: 90) Based on their study of Irish business incubators, Buckley and Davis (2018)
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6 stress the importance of individuals and/or teams having the appropriate levels of ‘absorptive
7
8 capacity’ to make the best use of incubator services,
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12 A study of businesses established by young entrepreneurs notes that 73% of the
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14 participants had developed informal ventures while still at school (Hickie, 2011). Jones and
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16 Giordano (2020) provide an example in their discussion of a fast-growing business that
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18 originated as a schoolboy ‘hobby’ based on eBay trading. Vicarious learning (Yeadon-Lee,
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20 2018) through observing organizational activities in cafes, restaurants and retail outlets as well
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22 as on TV programmes such as *Dragon’s Den* or *The Apprentice*) are ways of compensating for
23
24 a lack of for real-world experiences. However, the majority of young entrepreneurs in Hickie’s
25
26 (2011) study gained work experience before starting their businesses. Most were involved with
27
28 the kind of mundane retail activities familiar to students in schools, colleges or universities
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30 (working in fast-food restaurants, for example). Nevertheless, this experience provided insights
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32 into important elements of entrepreneurship such as understanding customers, working in
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34 teams and relationships with suppliers. In more formal terms, these experiences made a
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36 significant contribution to the development of their human capital (Seet *et al.*, 2018). Based on
37
38 the analysis of extensive secondary data, Jayawarna *et al.* (2014) found that human capital in
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40 childhood, adolescence and early adulthood was an important predictor of the likelihood that
41
42 individuals would pursue a career in entrepreneurship. Students demonstrating strong
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44 analytical abilities and high-level cognitive/creative abilities were strongly associated with a
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46 predisposition to start their own business. The authors summarise their findings by stating that
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48 a supportive family and a solid background in education provides a strong initial pathway to
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50 entrepreneurship (Jayawarna *et al.*, 2014).
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3 Finally, we examine key contributions to literature associated with communities of
4 practice. There is increasing recognition that creating a learning community of practice is
5
6 central to establishing effective UBIs.
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10 11 12 13 **Creating Communities of Practice** 14

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16 According to Lave and Wenger (1991), situated learning bridges the cognitive learning
17 processes and those social practices associated with the ‘lived-in world’. Therefore, learning
18 through what they describe as legitimate peripheral participation (LPP) draws attention to the
19 situated practices through which communities of practice (CoP) cooperate. Individuals develop
20 their identities and practices through participation in situated learning activities (Handley *et*
21 *al.*, 2006; Lave and Wenger, 1991; McDonald and Cater-Steel, 2017; Mercieca, 2017).
22 Handley *et al.* (2007) claim that, originally, situated learning in communities of practice was
23 associated with relatively small groups of skilled learners (tailors and midwives). Hence,
24 developing learning communities in a UBI is commensurate with Lave and Wenger’s (1991)
25 original conceptualisation of CoPs based on relatively small groups of learners. Wenger (1998)
26 argues that CoPs are defined by three key elements (see Van Weele *et al.*, 2018: 175): first, a
27 common understanding of the shared goals and interests associated with a community of
28 practice (supporting students in developing feasible business ideas, for example); second, the
29 shared norms, values and identities that contribute to a sense of belongingness; and third, a
30 shared repertoire associated with those mutual resources and capabilities, which are recursively
31 reproduced by the community’s social practices. Successfully creating a community of
32 entrepreneurs based in a UBI is based on three factors: i) community strength, ii) the quality of
33 boundaries (opportunities to interface with other CoPs) and iii) a community identity which is
34 focused on learning and development (Theodorakopoulos *et al.*, 2014: 611). While Kasperova
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3 *et al.* (2018) agree that entrepreneurial identities are shaped by social relations, they suggest
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5 that it is also important to consider the ways ‘cultural artefacts’ (building, information
6
7 technologies, etc) shape the motivation of incubatees.
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10 In any learning community, most knowledge is tacit and must be acquired directly
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12 through regular social interaction (Nonaka and Takeuchi, 1998). Such interaction also means
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14 that high levels of mutual trust are established in a CoP, enabling participants to share
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16 problems, knowledge, information and practices (Brown and Duguid, 1991; 2001). However,
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18 one of the main barriers to creating CoPs in UBIs is the issue of confidentiality associated with
19
20 science or technology based businesses. Confidentiality has been an issue for many
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22 entrepreneurs located in science-based university incubators (McAdam and Marlow, 2007). In
23
24 their study of Australian start-up businesses, Van Weele *et al.* (2018) found that entrepreneurs
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26 did regard themselves as belonging to a community of practice in which knowledge-sharing
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28 was the norm. Entrepreneurs operating in shared workspaces certainly engaged in shared
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30 practices, but even those in regionally distributed ecosystems created networks of practice
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32 (Nicholls-Nixon *et al.*, 2020; Van Weele *et al.*, 2018).
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37 Start-up accelerators (and incubators) should combine the three components of
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39 entrepreneurial learning labelled ‘know-what’, ‘know-how’ and ‘know-who’ (Seet *et al.*,
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41 2018). In one study, many of the respondents (incubatees based in an Australian accelerator)
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43 focused on the ‘know-who’ of the programme – ‘the people aspect of their learning experience’
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45 (Seet *et al.*, 2018: 246). This cooperative environment contrasted with the sense of isolation
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47 incubatees felt before joining the accelerator. *Mentors* delivered the most valuable learning
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49 based on their own ‘real-world’ experiences; *experts* in law, marketing, production and search
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51 engine optimisation were also useful; *peers* provided the opportunity for collaborative learning
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53 (Lévesque *et al.*, 2009), which encouraged motivation and self-confidence improving the
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55 chances of success; *customers/stakeholders* provided practical knowledge related to the
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3 nascent entrepreneurs' specific business problems (Seet *et al.*, 2018: 247–248). A study by
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5 Politis *et al.* (2019) demonstrates that learning in an accelerator is 'triggered' by three catalysts:
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7 affective motivation, constructive feedback and peer atmosphere (see Hackett and Dilts, 2008).
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9 Incubation managers can provide links between incubatees who need advice or information
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11 and individuals or organizations that can provide the necessary support (Wenger 2000; 2009;
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13 Garavan *et al.*, 2007). Brokers may also establish links between various CoPs by introducing
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15 members or practices from one community to another (Wenger *et al.*, 2002). The study carried
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17 out by Van Weele *et al.* (2018) confirms the importance of IMs adopting roles as facilitators to
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19 introduce newcomers to the incubator (CoP) and as brokers to build links with external
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21 knowledge and resource providers.
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26 In the following section, we draw together the main elements from the literature to
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28 develop a model of university-based incubation. It is important to note that we do not see the
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30 incubator as science or technology based, but as open to a wide range of businesses and
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32 business ideas.
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38 **Towards a Community of Practice: Situated Student Learning**

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41 Drawing on the literature reviewed above, we suggest the model depicted in Figure 1, which
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43 outlines the key elements of an incubator-based community of practice. The principle
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45 underlying our model is that students will have varied educational experiences, including those
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47 without backgrounds in business/management, and nor will they all have studied the physical
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49 sciences. Thus, the type of incubator we are advocating will not be science or technology based.
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51 As McAdam and Marlow (2007) established, confidentiality can be an issue for entrepreneurs
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53 developing ideas based on proprietary intellectual property. We propose that greater diversity
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3 will encourage knowledge-sharing amongst incubatees and help to build a thriving community
4 of practice (Farnsworth *et al.*, 2016; Nicholls-Nixon *et al.*, 2020; Van Weele *et al.*, 2018).
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11 **Figure 1 about here**
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14 Ideally, UBIs will not only provide a physical space but will also act as a social space
15 in which students, the management team, business advisers/mentors and external speakers can
16 meet informally. These social spaces should function as a basis for networking activities and
17 provide a safe environment for students to discuss their ideas while working towards a common
18 goal of establishing their businesses. As pointed out by Tocher *et al.* (2015), ‘social resources’
19 are fundamental to effective businesses opportunity development and exploitation (see Morris
20 *et al.*, 2013). Those responsible for supporting students attempting to start new businesses have
21 a key role in ensuring that they can develop their bridging and bonding social capital (Lee,
22 2017; Lee and Jones, 2008; Redondo and Camarero, 2019b). The centre of the model (Figure
23 1) focuses on the learning processes which help incubatees identify and develop ideas into
24 feasible business propositions (Jones and Giordano, 2020). At the same time, belonging to a
25 community of practice will help develop their entrepreneurial identities as they make the
26 transition from student to entrepreneur (Klapper and Refai, 2015). Not all those entering a UBI
27 will go on to start their own successful businesses. We do, however, suggest that the learning
28 experience in a UBI can equip recent graduates with an enterprising mindset that will help them
29 whatever career they pursue in the future.
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51 The concurrent processes of developing a business idea (Ardichvili *et al.*, 2003),
52 entrepreneurial identity (Kasperova *et al.*, 2018) and CoP membership (Handley *et al.*, 2006;
53 2007) are shaped by the knowledge and experience, skills and resources (human capital) that
54 incubatees gain during their time in education. As discussed above, those with some work
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3 experience (Hickie, 2011) while in school, college or university will be best placed to take
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5 advantage of the opportunities offered by being based in an incubator. Well-developed social
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7 skills are certainly important in terms of young entrepreneurs extending their close network
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9 ties as a means of accessing additional resources (Tocher *et al.*, 2015). Resources possessed by
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11 those entering a UBI are more likely to be intangible than tangible. Most students will have
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13 incurred substantial debts during their studies and therefore will lack access to financial capital.
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15 Adopting an effectual approach to start-up by bootstrapping (Jayawarna *et al.*, 2020; Jones and
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17 Jayawarna, 2010) additional resources will ensure that young entrepreneurs can start their
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19 businesses without incurring an additional financial burden. As pointed out by Battisti and
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21 McAdam (2012), family and friends are the most important resource providers for graduates at
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23 the start-up stage. These arguments are further supported by an earlier study that identified the
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25 importance of networking in a university incubator (McAdam and McAdam, 2006). Based on
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27 social capital theory, Bøllingtoft and Ulhøi (2005) confirm the need for incubatees to build
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29 extensive internal networks as a means of enhancing their learning. In addition to bonding
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31 (internal) social capital, an effective community of practice encourages external network links
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33 and the creation of bridging (external) social capital (Redondo and Camarero, 2019b).
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40 Many recent studies identify the central role of the manager and management team as
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42 key to successful business incubation (Galvão *et al.*, 2019; Mian, 2014; Nair and Bloquist,
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44 2019; Redondo and Camarero, 2017; Theodorakopouou *et al.*, 2014). However, most existing
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46 studies focus on science/technology-based incubators rather than incubators that support a
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48 range of businesses (Battisti and McAdam, 2012; Diez-Vial and Montoro-Sanchez, 2016;
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50 Huynh *et al.*, 2017; Mascarenhas *et al.*, 2019; Patton and Marlow, 2011; Redondo and
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52 Camarero, 2019a; Wann *et al.*, 2017). Nevertheless, scholars are clear that the IM or
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54 management team are key in ensuring that incubatees benefit from their tenancy (Kakabadse
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56 *et al.*, 2020). Key studies confirm that the IM is essential for creating relational social capital
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3 based on trust and reciprocity amongst incubatees (Carvalho and Galina, 2015; Redondo and
4 Camarero, 2019b). Previous experience in business, or as an entrepreneur, is also regarded as
5 highly desirable for successful incubator managers (Breznitz and Zhang, 2019). Such
6 experiences ensure that IMs are effective in adopting a ‘brokerage’ role linking incubatees to
7 external business networks (Redondo and Camarero, 2019b). The manager’s role in providing
8 access to potential customers, funders, experienced entrepreneurs and business owners was
9 also identified as crucial to the development of businesses in a Dublin-based UBI (Ahmad and
10 Ingle, 2011). Other work focuses on the distinction between the manager’s formal role
11 associated with meeting targets by monitoring and measuring and informal activities associated
12 with coaching and mentoring (Ahmad, 2014; Ahmad and Thornberry, 2018). In their recent
13 study, Kakabadse *et al.* (2020) suggest that incubation managers are primarily focused on
14 supporting incubatees by mentoring during the difficult start-up period. The more formal
15 requirements associated with meeting targets for income generation and graduation rates were
16 regarded as ‘red tape’ which limited their ability to provide real support for incubatees
17 (Kakabadse *et al.*, 2020). Therefore, the importance of learning within any UBI will be shaped
18 by the manager or management team (Figure 1).

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40 Most UK universities now have entrepreneurial clubs and societies which promote the
41 importance of entrepreneurship to their students. An exploratory study based on previous
42 research undertaken to better understand entrepreneurial learning identifies the key role played
43 by clubs and societies in enhancing the skills of students (Pittaway *et al.*, 2011; 2015). As the
44 authors go on to point out, club membership is an important factor in developing the social
45 skills necessary for students to become successful entrepreneurs. Therefore, we suggest that it
46 is essential that campus-based clubs and societies associated with entrepreneurship are
47 encouraged to have a role in UBIs.
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3 Jones and Macpherson (2014) point out that entrepreneurial research has become
4 increasingly accepted in recent years, with many publications appearing in top-rated business
5 and management journals. Those involved with research on entrepreneurship and small
6 businesses are often involved in projects designed to support new and existing small
7 businesses. Lancaster University's LEAD (Leadership and Enterprise Development) initiative
8 has been widely adopted by other business and management schools to enhance the leadership
9 skills of small business owners (Barnes *et al.*, 2015; Gordon *et al.*, 2011; Kempster and Smith,
10 2015; Smith and Robinson, 2007). The programme is also important for confirming the
11 'impact' of entrepreneurship research with leading UK schools such as Lancaster, Liverpool,
12 Leeds and Manchester Metropolitan submitting cases to the 2014 Research Excellence
13 Framework (REF)⁶ exercise. Hence, we suggest that the entrepreneurship research community
14 is distinctive in its desire to make a practical difference as well as contributing academically
15 by publishing in top-rated journals.
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33 McAdam *et al.* (2016) examined business incubation in two quite different UK
34 universities. One belonged to the Russell Group (the 24 most research-intensive UK
35 universities) and the other belonged to Universities UK, which represents 137 institutions. The
36 differences were reflected in their support for start-up businesses. The Russell Group university
37 adopted a traditional physics-based approach to incubation, while the Universities UK
38 institution supported a virtual incubator, which was open to a much wider range of businesses.
39 Hence, we suggest that the nature of the university in which an incubator is established will
40 have a key role in shaping the approach to business incubation. This can be summarised in the
41 extent to which an institution fulfils the requirement for being an 'entrepreneurial university'
42 (Etzkowitz *et al.*, 2000). The UK paper *Times Higher Education* makes an annual award,
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59 ⁶ [https://results.ref.ac.uk/\(S\(whvf1ztk1p41c5y15ssuj01e\)\)/Results/ByUoa/19/Impact](https://results.ref.ac.uk/(S(whvf1ztk1p41c5y15ssuj01e))/Results/ByUoa/19/Impact) (accessed December 2020).
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sponsored by the National Centre for Entrepreneurship in Education,⁷ for the ‘outstanding entrepreneurial university’ based on the following criteria:⁸

- ‘vision and strategy place enterprise, entrepreneurship and innovation at the heart of the organisation’;
- an environment that ‘encourages entrepreneurial mindsets and behaviours in staff and students, and ensures that ideas and innovation are nurtured and given the support they need to flourish’;
- ‘the strategic approach to entrepreneurship has the potential to influence and improve other institutions’ work in this area, whether directly or because it is transferable in the sector more widely’.

Loughborough University won the 2019 award, indicating a strong commitment to supporting student entrepreneurship. The university also hosts a business incubator, LU Inc.; ‘Our community is made up of graduate start-ups, spinouts led by researchers or academic staff and founders from outside Loughborough University, looking for a vibrant start-up environment.’⁹ The other indicator of a university’s commitment to supporting entrepreneurship and small business in the UK is the Small Business Charter (SBC) of the Chartered Association of Business Schools. As indicated on its website,¹⁰ ‘The Small Business Charter (SBC) award gives recognition to business schools that play an effective role in supporting small businesses, local economies and student entrepreneurship’. Currently, 33 business/management schools are members of the SBC. Entrepreneurial universities (Etzkowitz, 2003; Woollard *et al.*, 2007) share a commitment to local and regional economic development through a focus on entrepreneurship and innovation. Such institutions will demonstrate their support for student entrepreneurship by providing incubation or hatchery facilities (Culkin and Mallick, 2010; McAdam and McAdam, 2006; McAdam and Marlow, 2007).

⁷ <https://ncee.org.uk/about-us/> (accessed 24 September 2020).

⁸ <https://www.the-awards.co.uk/2020/en/page/categories-and-criteria> (accessed 24 September 2020).

⁹ <https://www.lusep.co.uk/lu-inc> (accessed 24th September 2020)

¹⁰ <https://chartereddabs.org/small-business-charter/> (accessed on 24th September 2020)

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3 While experiential learning theory (Kolb, 1984) has been important to a better
4 understanding of entrepreneurship, it is suggested that such learning is ‘backward looking’
5 (Berends *et al.*, 2016). According to Berends *et al.* (2016), experiential learning is based on an
6 individual entrepreneur’s reflections on previous experiences and ignores their sensemaking
7 activities related to the future needs of their businesses. Berends *et al.* (2016) argue that a
8 cognitive approach to learning, which they describe as ‘forward looking’, places greater
9 emphasis on the future than on the past. Our view is that experiential learning and cognitive
10 learning are, in practice, complementary and reflect two sides of the same coin. Jones and
11 Giordano (2020) suggest that experiential learning feeds forward into cognitive learning and
12 the latter ‘feeds backward’ into experiential learning (Gavetti and Levinthal, 2000). The two
13 processes are part of a continual learning cycle in which previous experience and understanding
14 are the basis for the next stages in the opportunity identification and development process
15 (Figure 1). Learning activities by which knowledge and skills are transformed into business
16 opportunities and the beginnings of new entrepreneurial identities are embedded in the inner
17 boundary (feed forward/feed back). This is where learning occurs at a more individual level as
18 well as via interactions between members of the incubator community. These interactions are
19 based on their different types of prior knowledge as well as new information, skills, experiences
20 and resources acquired while in the incubator. Also, as individual incubatees, and the group,
21 become more familiar with the issues associated with entrepreneurship (learning as becoming)
22 their identities as ‘real’ entrepreneurs are increasingly legitimised (Kasperova *et al.*, 2018;
23 Klapper and Refai, 2015; Wenger, 1998).

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52 The core of our argument is that those based in a UBI should be encouraged to
53 contribute to a learning community of practice. In Figure 1, the outer ellipse represents this
54 incubator community of practice, where incubatees’ human capital (resources, skills,
55 knowledge and experience) combines with inputs from the IM to develop their business ideas

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3 and create new entrepreneurial identities (Klapper and Refai, 215: 165–166). During the
4 incubation process, all incubatees should be encouraged to acquire new skills and new
5 knowledge by regular interaction with members of their peer group as well as with the
6 management team, business mentors/advisors, experienced entrepreneurs and business owners.
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12 As pointed out by Wright *et al.* (2017), UBIs supporting student start-ups should be
13 linked into the regional ecosystem. Their model includes several factors in addition to the
14 incubator/accelerator: entrepreneurs (faculty, student, post-docs and alumni), support
15 (corporate, public agencies, alumni, technology transfer offices), investors (government grants,
16 business planning competitions, university seed-corn funds, crowdfunding, angel investors,
17 venture capitalists), as well as the regional institutional context (Wright *et al.*, 2017: 911).
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19 Other authors suggest several additional actors in effective regional ecosystems, such as a
20 skilled labour force, suppliers, customers and markets (Kumar *et al.*, 2020; Nicholls-Nixon *et*
21 *al.*, 2020). The importance of links between incubator and ecosystem are summarised by Nair
22 *et al.* (2020: 9): ‘Late-phase support systems, such as incubators and accelerators, are essential
23 components of an ecosystem that facilitates new venture creation, by providing critical tangible
24 and intangible resources’.
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41 Figure 1 illustrates the factors influencing the creation of a student community of
42 practice in a university-based incubator (UBI). The aim is to take undergraduate and
43 postgraduate students who are interested in entrepreneurship and support them in developing
44 feasible business ideas and new identities as entrepreneurs. Ultimately, students should
45 graduate from the UBI with the knowledge and experience to create a functioning new
46 business. However, those that decide entrepreneurship is not for them should still benefit from
47 the skills and experience gained while in the incubator. The creation of a successful UBI
48 community of practice should have several benefits for the region and for the university
49 (Wright *et al.*, 2017). New businesses should feed in to the local ecosystem, building higher
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3 levels of economic activity and creating new job opportunities. For the university, a successful
4 incubator should demonstrate the institution's support for the regional economy and help to
5 attract enterprising students to a range of different programmes.
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10 11 12 13 **Conclusions**

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16 Over the last twenty years there has been increasing interest in entrepreneurship (enterprise)
17 education in UK higher education institutions. Most universities now offer programmes and
18 modules focused on the creation of new businesses. At the same time, many universities have
19 invested in business incubation facilities to support students and graduates in navigating the
20 complexities of starting their own businesses. The main contribution of this paper is to draw
21 on a wide range of literature associated with business incubation, entrepreneurial learning and
22 communities of practice to develop a model of an effective university-based incubator (see
23 Figure 1). As Horner *et al.* (2019) point out, the extent to which universities engage in activities
24 associated with technology transfer is based on the strategic choices made by senior managers.
25 Therefore, any decision to create and operate a UBI must fit with the university's broad strategy
26 related to the support of students contemplating a move into entrepreneurship (Culkin and
27 Mallick, 2010; Soetanto and Jack, 2016). As we discuss above, this can be summarised by the
28 extent to which an institution meets the criteria to be designated an 'entrepreneurial university'
29 (Carayannis and Rakhmatullin, 2014; Etzkowitz, 1998; 2003; McAdam *et al.*, 2016).
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48 The central thrust of our argument is that, once established, a UBI should become a
49 genuine learning-based community of practice (Farnsworth *et al.*, 2016; Lave and Wenger,
50 1991; Wenger, 1998; 2009; Wenger *et al.*, 2002). Figure 1 demonstrates that the incubator
51 manager/management team will have a central role in developing a community of practice
52 (Kakabadse *et al.*, 2020). Although there are conflicting views about the best background for
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3 the manager of an incubator (Redondo and Camarero, 2017), it seems clear that IMs need to
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5 balance the institutional output requirements while offering mentoring and support to
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7 incubatees (Nair and Blomquist, 2019; Redondo and Camarero, 2019b). IMs also have an
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9 important role in the selection of candidates (Van Weele *et al.*, 2019) who will become active
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11 members of the learning community. Entrepreneurial clubs and societies (Pittaway *et al.*, 2011;
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13 2015) as well as university educators (Matlay, 2009) and researchers (Barnes *et al.*, 2015) can
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15 also play an active role in the creation of a community of practice. The human capital
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17 (Jayawarna *et al.*, 2015) of those entering the incubator, in the form of resources, knowledge
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19 and experience, and skills, will also influence the extent to which knowledge is shared amongst
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21 member of the community of practice (Nonaka and Konno, 1998; Nonaka and Toyama, 2015;
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23 Rennemo and Åsvoll, 2019). Consequently, regular dialogue between incubatees will promote
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25 and facilitate reflective learning (Baker *et al.*, 2005; Farnsworth *et al.*, 2016; Kolb and Kolb,
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27 2005).

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33 At the core of our model are the learning processes that transform inexperienced
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35 students and graduates into entrepreneurs with the ability to establish new businesses with the
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37 potential for longer-term survival and growth (Jones and Giordano, 2020). The feed-forward
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39 (cognitive) and feed-back (experiential) learning processes (Berends *et al.*, 2016) shape the
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41 development of incubatees' business ideas (Ardichvili *et al.*, 2003), as well as their
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43 entrepreneurial identities (Kasperova *et al.*, 2018). Various authors have suggested that, to be
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45 entirely effective, UBIs need to be linked to the local ecosystem (Breznitz and Zhang, 2019;
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47 McAdam *et al.*, 2016; Nicholls-Nixon *et al.*, 2020). Therefore, we propose that incubator
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49 managers need to cultivate links with a number of actors, including business mentors and
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51 advisors, potential funders (business angels/venture capitalists), other regional incubators,
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53 small firms and policy-makers.
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5 **Figure 1 is supplied in separate PPT file.**
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9 **Figure 1.** The student entrepreneur community of practice.
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For Peer Review

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