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Signature Pedagogy for Entrepreneurship Education: An Emerging Perspective

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Abstract

Entrepreneurial ways of thinking and doing intersect with the knowledge and skills that a global citizen needs to thrive. There is a robust body of scholarship that identifies core entrepreneurial skills however there is a dearth of evidence addressing how to successfully teach entrepreneurship. Using the lens of experiential learning, this qualitative study examines the surface, deep, and implicit structures of professional entrepreneurial culture toward revealing a meaningful, authentic pedagogical approach for entrepreneurship education. In order to achieve this outcome, researchers utilized a semi-structured comparable multiple-case study design to engage 19 incubated entrepreneurs in focus group interviews. A replication strategy to inductive qualitative analysis was employed toward cross-case analysis. Findings revealed that incubated entrepreneurs routinely engage in a wide variety of transdisciplinary experiences characterized by cycles of success and failure. Additionally, face-to-face interactions that are grounded in a network of trust were revealed to be a vital part of the entrepreneurial process. Thus, pedagogies anchored in the design process would provide an authentic, experiential context in which to prepare future entrepreneurs. Implications for elementary and secondary educational approaches are discussed.

Keywords: entrepreneurship education, STEAM, design, experiential learning, pedagogy

Innovation, in the context of business and/or entrepreneurship, may be defined as the “successful exploitation of ideas, into new products, processes, services or business practices” (Department of Trade & Industry, 2003), and an entrepreneur is “the agent of change” that finds a market opportunity, has an idea about how to exploit the opportunity, and can marshal resources to successfully enact the

opportunity (Lalkaka, 2002). Entrepreneurial innovation has been shown to impact local and national economies positively and powerfully through improved technological, scientific, and social innovation (Theodorakopoulos et al., 2014). Entrepreneurial ways of thinking and doing have far reaching utility to equip a wide range of citizens with the necessary knowledge and skills to thrive in “an increasingly globalized life-world of greater uncertainty and complexity” (Gibb & Price, 2014, p. 6). It is therefore worthwhile to consider intentionally training this “entrepreneurial mind” as a goal for elementary and secondary education.

What makes a successful entrepreneur? Can an entrepreneurial mindset be trained? There is much recent scholarship seeking to identify and clarify the skills and abilities that are embodied by entrepreneurs to cultivate a “greater capacity for entrepreneurial agency” (Jones, 2019, p. 243) in students from elementary school into college. Despite existing knowledge frameworks of what should be taught, the educational community has yet to embrace a common understanding of how to teach entrepreneurship (Gibb & Price, 2014; Jones, 2019; Peschl et al., 2020). This study therefore focused on connecting knowledge, experiences, and values of entrepreneurs to inform a characteristic, key pedagogy for entrepreneurship education (Jones, 2019).

In keeping with the dynamic, social nature of how successful entrepreneurs work, researchers approached the study by interviewing groups of entrepreneurs who were participating in a collective network (reminiscent of a classroom). Interview results were analyzed via open coding and also through the lens of experiential learning theory (Kolb, 1984) to reveal the important knowledge and experiences as identified by participants. All results were then triangulated to create a clear picture of how entrepreneurs think, perform, and act in their work context, thus providing a roadmap toward informing how to teach future entrepreneurs: a possible signature pedagogy (Shulman, 2005).

Review of the Literature

The State of Entrepreneurship Education

With the pressing need for an innovative citizenry there has been an explosion in the presence of entrepreneurship education courses and accompanying guidelines in the American pre-secondary public schools to equip all students with an entrepreneurial mindset toward being better prepared with essential real-life skills such as creativity, curiosity, risk-taking, persistence, and grit (Hess, 2006; Hess & McShane, 2016; Rodov & Truong, 2015). Heretofore, educating entrepreneurs has largely occurred within the domain of “Business Education”, resulting in what many researchers continue to identify as a persistent mismatch of pedagogy and desired learner outcomes (Haase & Lautenschläger, 2011; Higgins et al., 2013; Hoover, 2019; Mukesh et al., 2020; Neck et al., 2014; Rae, 1997). Research studies that inform the preparation of budding entrepreneurs are less prevalent and most of this scholarship exists in the context of undergraduate education (e.g. Krakauer et al., 2017; Mason & Arshed, 2013; Peschl et al., 2020).

Since 2000, there has been a notable amount of research, theoretically grounded in Experiential Learning Theory, that has emerged with the goal of understanding the process of entrepreneurship and

identifying the characteristics of a successful entrepreneur (Kolb & Wolfe, 1981). Indeed, many experts agree that when educating future entrepreneurs, simply knowing is not enough; education should be authentic and experiential (Gold & Kerly, 2019; Higgins et al., 2013; Mukesh et al., 2020; Neck et al., 2014). Recently, Peschl et al. (2020) performed and published a comprehensive literature review and identified seven key entrepreneurial skills: 1. Problem solving, 2. Tolerance for ambiguity, 3. Failing forward, 4. Empathy, 5. Creativity with limited resources, 6. Responding to critical feedback, and 7. Teamwork approach. Collectively, these skills give educators a target as to what should result in students.

Despite existing knowledge frameworks of the knowledge and skills that should be taught, the educational community has yet to embrace a common understanding of how to teach entrepreneurship (Gibb & Price, 2014; Jones, 2019; Peschl et al., 2020). A clear educational framework in which to develop creativity, build community, spur innovation, and support transformative learning is essential (Jones, 2019).

Experiential Learning Theory

Education, work, and personal development are all linked through intersecting experiences. Experiential learning theory (ELT) provides a framework for understanding how adults learn, placing emphasis on the importance of the role that experience plays in the learning process. Grounded in the work of Dewey, Lewin, and Piaget, ELT focuses on the process of knowledge creation via first acquiring and then reflecting on lived experiences (Kolb, 1984; Kolb, 2014; Kolb & Yeganeh, 2016). By no means is this theory suggesting that all experiences lead to meaningful learning; to be educative, i.e., to support growth, experiences should be intentionally connected to one another, allowing learners to continuously hone understandings and skills within new situations (Dewey, 2007).

New knowledge, skills or attitudes are achieved through interactions among four modes of experiential learning. Kolb (2014) asserts that learners can grasp knowledge in each situation through concrete experience (CE) or abstract conceptualization (AC). “That is, they must be able to involve themselves fully, openly, and without bias in new experiences (CE) . . . and/or create concepts that integrate their observations into logically sound theories (AC)” (p.137). After “grasping” knowledge, learners must then interpret and act on their experiences, through either reflective observation (RO), (ie: “reflecting on and observing experiences from many perspectives”), or active experimentation (AE), thereby “using theories to make decisions and solve problems” (Kolb, 1984, pp. 137–138). Thus, one creates knowledge through transforming experience and deepened learning happens through “successive iterations of experiencing, reflecting, thinking, and acting to create new experiences for another cycling through the learning process” (Kolb, 2014, p. 449).

Further research in ELT reveals that patterns, as influenced by personality types, education, professional career choices, job role, and adaptive competencies, in how people choose to gather and transform knowledge can be detected and these resulting learning styles have been widely published (Kolb, 1984; Kolb, 2014b; Kolb & Wolfe, 1981; Kolb et al., 2000; Kolb & Yeganeh, 2016). Since the first publication of ELT (Kolb, 1971), researchers in the diverse fields of study (to include, but not limited to, Accounting,

Computer and Information Science, Education, Law, Management, Medicine, Nursing, and Psychology) have utilized the model to explore and reveal characteristic disciplinary patterns and unique aspects of learning (Kolb et al., 2000).

Signature Pedagogies

When considering how professionals are trained, Lee Shulman argues that there is a characteristic, pervasive form of teaching that helps future practitioners learn “to think, to perform, and to act with integrity” as they prepare for their future profession. He refers to this specific educational approach as the signature pedagogy (Shulman, 2005a, p. 52). Through observation and documentation of the type of teaching and how learning occurs in different settings, Shulman has been able to define signature pedagogies for many different professions, such as law, medicine, engineering, and clergy (2005b). And yet, there exists a marked absence of information about the most impactful way to implement training to support the incubated, innovative learner. Most studies concern themselves primarily with the management or incubator’s perspective rather than that of the tenants (Albort-Morant & Ribeiro-Soriano, 2016; Culkin, 2013). As of the writing of this manuscript, no signature pedagogy has been defined for the preparation of entrepreneurs.

Shulman (2005a) further characterizes a signature pedagogy as having three unique dimensions: the surface structure - the tangible parts and interactions of the learning environment, the deep structure - the learning culture that is guided by often unspoken beliefs about how best to learn to be a professional, and the implicit structure - the values, attitudes and dispositions of professionals (see Shulman, 2005a, p. 55). Finally, Shulman (2005) asserts that any pedagogy that is defined as signature to a profession will be “pervasive and routine” across learning experiences in order to instill the habits of the profession into the learner (p. 56). These habits will be solidified through practice in the classroom and subsequent performance in authentic contexts.

Study Context

The growth and success of a country is increasingly dependent on the creativity and innovativeness of its citizens. As stated by Moriset (2013), who in turn quotes Govindarajan (2010a), creativity and innovation are complimentary ideas: creativity is about generating a big idea, “while innovation needs an efficient process of ‘execution’ that will transform the idea in marketable goods and service” (p.3). While large-scale innovations are usually what grab headlines, it is the small businesses, oftentimes located in non-hub areas, that carry significant impact within the world’s economies (Mazzarol & Reboud, 2020). These local agents of change are considered innovators when they “successfully exploit ideas into new products, processes, services, or business practices” (Department of Trade and Industry, 2003, p. 8).

To promote and support entrepreneurial innovation, individuals with ideas, young firms, and startups need an ecosystem of support to nurture growth until they are mature enough to stand on their own. Communities may take an active role in transforming their economy by promoting open dialogue and building awareness of the power of entrepreneurship to affect positive changes (Hoover, 2019).

Business incubators (BI), co-working spaces (CO), and makerspaces/hackerspaces (MS) are all collaborative endeavors explicitly working to stimulate entrepreneurial activities, but each has a unique focus.

Many definitions for business incubators exist in the literature. In general, definitions intersect around the idea that an incubator is an explicitly interconnected group of individuals and/or organizations that work as a network to provide resources needed to drive innovation and support evolution of each member (Hackett & Dilts, 2004). Ayyash et al. (2020) bring these concepts current and propose unifying the wide variety of BI definitions as follows: (p. 11):

An organization that facilitates the process of creating successful new small enterprises by providing them with a comprehensive and integrated range of services, including:

1. Incubator space . . . on flexible and affordable terms;
2. The provision of a comprehensive range of common services;
3. Strict admission and exit rules, which are designed to ensure that the incubator concentrates its efforts on helping innovative, fast-growth business start-ups that are likely to have a significant impact on the local economy;
4. Professional management...ensuring that the incubator itself operates in a business-like fashion with the prospect of becoming financially self-sustaining.
5. 'Hands on' assistance, including R&D advice and risk capital, usually through a network of external providers. (Adegbite, 2001, p. 189)

Underpinning the BI definition is the assumption that the organization is composed of adult learners; thus, the incubator should work to enable meaningful learning experiences for its members to support sustainability. This "learning system" (Kolb & Kolb, 2009, p. 43) then necessitates not only providing resources and opportunities, but also intentional, purposeful guidance for members on how to learn and grow from the experiences. Within the literature, however, there exists a marked absence of information about the most impactful way to implement training to support the incubated, innovative learner.

Fuzi (2015) defines co-working spaces as environments that foster collaborative process, knowledge and idea sharing, networking between professionals, freelancers and small firms all coming from different fields; these spaces provide shared work settings available for rent (Merkel, 2015). Co-working spaces have been increasing in popularity as professionals seek out workplaces where they can find like-minded individuals and increase the likelihood of having autonomy in their job (Weijs-Perree et al., 2019).

Finally, a makerspace (also known as hackerspace or fab-lab) is a place where people pay fees to have access to tools, machinery and working spaces. Makerspaces may also offer communally available classes, usually centered on the tools they have available. The close relationship that may be fostered in this kind of collaboration can also stimulate mutual sharing of knowledge, ideas and expertise among members who are from a variety of educational and professional backgrounds. All of these resources can be used to improve the incubatee's individual business or work (Van Holm, 2015).

Of note is the absence of the term “innovation” in the definitions of makerspaces and co-working spaces, thus distinguishing them from incubators. As asserted by Govindarajan (2010b), creativity and innovation should not be equated; they are complementary constructs. Creativity is about generating a novel idea, whereas innovation is concerned with the successful execution of that idea (Govindarajan, 2010b). Clearly, both creativity and innovation are important for economic growth and development, but definitions suggest that in makerspaces and co-working spaces creativity is the primary outcome, while incubators support innovation, entrepreneurship, and creativity. Researchers therefore concluded that the BI is an authentic context in which to gather data to inform entrepreneurship education efforts.

Study Objectives

Drawing from Shulman’s example, the researchers strove to learn from actual entrepreneurs who are in different stages of realizing their ideas, to reveal how these creative innovators “think, perform, and act with integrity” as they engage in their work (Shulman, 2005a, p. 52).

Utilizing an analytical lens of experiential learning theory, the study team addressed the following research question: What knowledge, experience, and culture are characteristic of practicing entrepreneurs in an incubated setting? Given the results from the research question, authors demonstrate how primary and secondary teachers can best support the training of future entrepreneurs.

Method

Research Design

Researchers utilized a semi-structured comparable multiple-case study to improve confidence in the transferability of resultant recommendations (Miles et al., 2020). After acquiring approval from the first author’s institutional review board (IRB), researchers defined each case to be a non-hub business incubator within the southeastern United States (US), as profiled in a related research study (Brivio et al., 2020). Non-hub incubators were chosen to provide a homogeneous sample of the dominant form of incubator available in the region of focus.

Participant Recruitment

Using snowball sampling methodology, researchers contacted managers of several non-hub incubators in the identified study area. Originally, six sites expressed interest in participating in the research; however, one incubator closed, and one incubator withdrew before the actual interviews were conducted. Within case participants, defined as business incubator members or incubatees, were recruited by the manager of the participating incubator by personally inquiring of their incubatees regarding their interest and availability. Managers then communicated a list of interested incubatees and their contact information to the study team.

Only BI members were invited to participate in the study to 1) achieve homogeneity through shared experiences as a naturally occurring membership cohort and 2) encourage diverse conversation among members with different entrepreneurial focuses. No exclusion criteria were employed other than being BI members. No demographic data were gathered about participants and their businesses for the purpose of this research.

Data Collection

Ultimately, the study team interviewed 19 members of four non-hub business incubators in the southeastern United States (U.S.) during 2018. Researchers opted to conduct interviews via face-to-face focus groups to gather data from individuals as well as from the verbal interactions of members (Kitzinger, 1995). Each of the four focus group sessions occurred at a local place, comfortable for all members and snacks were provided by the study team to encourage a friendly and social atmosphere. Participants were first asked to give written consent for the focus group interactions to be audio and video recorded and the researchers were careful to remind each participant that no question was required to be answered by any one person, but all questions were open to being answered by all participants.

Each session began with a short drawing activity designed to initiate conversation, build rapport, and engender trust among the group as well as with the research team (Schensul et al., 1999). The team provided participants with many colors and types of paper along with a variety of colored pencils, crayons, and markers and asked them to first draw themselves at work and then asked for volunteers to describe the drawing and their feelings about the drawing to the group. The drawings and presentations were recorded for further analysis in a related project (Schensul et al., 1999). After completing this activity, researchers began asking the pre-planned, literature-based, open-ended questions of the group, “beginning the discussion with the focal topic” (Schensul et al., 1999, p. 88). Close attention was paid to facilitating engagement of all group members with not only answering the question but with each other during the conversation toward revealing individual perspectives, common understandings, consensus, and discontents. Throughout the focus group experience, researchers were careful to follow up with open-ended clarification questions as needed. Focus group experiences were planned to last approximately 60-75 minutes and the average interview time was 70 minutes.

Analysis

Transcripts of the focus group interactions were generated and uploaded into QSR International’s NVivo 11 Qualitative analysis software for analysis. Utilizing NVivo, two authors employed a replication strategy to the cross-case analytical process by engaging in the constant comparison method of inductive coding, analytic memoing, and subsequent discussion within one case (Miles et al., 2020). Following are detailed descriptions of the analytical processes and accompanying tables presenting succinct representations of analytical results.

Researchers agreed to utilize descriptive and in vivo codes during the first cycle, followed by a second cycle where the initial codes were collapsed into pattern codes. An initial codebook (Table 1) was generated from these discussions; the authors then proceeded independently through the remaining cases, using the codebook as a guide.

Table 1
Codebook

Code	Definition
Barrier	Any perceived obstacle identified to business growth or incubator health.
Community	The city in which the incubator exists and the location of most of the incubator's interactions
Creativity	Any references to creativity
Education	Any reference to K-12 education
Empower	Statements identifying sources of empowerment.
Face-to-face	Any reference to preference of face-to-face contact within the incubator or outside the incubator.
Goal	Self-proclaimed goals or motivation to do with self and/or self-business
Government	Any references to government or related aspects except for education and public health.
Inward focus	Self-serving statements about the inner community of the incubator, the value of the incubator, the town serving the incubator, etc.
Management	Relationships and what they need to do to provide for the members. (or are not doing)
Mentorship	References to giving/receiving advice; training or counseling.
Networking	Deliberate meeting attempts to include but not limited to slack channel, happy hours, lunch and learn, pitch camp.
Physical environment	Any reference to the physical facility of the incubator.
Public Health	Any mentions of public health as distinctive from government
Self-presentation	Statements of and/or related to personal efficacy, identity, interest, or personal history.
Side business	References to secondary businesses related to incubator membership.
Sponsorship	Support or backing of a member or member's business
University partnership	Any references to involvement with a local University.

NVivo was used to compare inter-rater agreements by generating both a percent agreement and Cohen's K for word and coding agreements. Average values of $K \geq 0.50$ were accepted to achieve above moderate indication of consensus (Landis and Koch, 1977). If this threshold was not achieved, rounds of discussion and revisions to codes were continued until the measure was reached. Inter-rater agreement values are reported in Table 2.

Table 2
Inter-rater agreement values

Code	Kappa	Agreement (%)
Barrier	0.753	93.865
Community	0.685	96.508
Creativity	0.824	98.808
Education	0.917	99.133
Empower	0.658	98.800
Face to Face	0.727	96.825
Goal	0.745	98.370
Government	0.906	99.1823
Inward focus	0.578	94.937
Management	0.756	97.937
Mentorship	0.707	97.790
Networking	0.738	97.300
Physical Environment	0.729	98.325
Public Health	0.643	98.698
Self-Presentation	0.752	95.938
Side Business	0.830	99.603
Sponsorship	0.543	98.042
University Partnership	0.806	98.570

After coming to agreement as described above, NVivo was again used to support making meaning across codes. First, to understand how the codes intersected, NVivo was used to investigate these intersections by performing a coding comparison. The resulting statistical word similarities (as expressed by Pearson's coefficient and by Jaccard's coefficient) based on coding and word were explored. Second, strongly using word similarity-based correlated ($r > 0.69$) and strongly overlapping ($S_j > 0.69$) nodes as a guide, the context surrounding each intersection was discussed and researchers came to agreement as to what these data revealed (see Table 3).

Table 3

Word similarity between nodes, based on Pearson's correlations and Jaccard's values (in parenthesis). Values for innovation, incubator, entrepreneurship and connection are not reported (all $r < .001$, $S_j < .001$).

	Barrier	Community	Creativity	Education	Empower	Face to Face	Goal	Government	Inward focus	Management	Mentorship	Networking	Physical Environment	Public Health	Self-Presentation	Side Business	Sponsorship
Barrier																	
Community	.80 (.40)																
Creativity	.68 (.19)	.63 (.27)															
Education	.71 (.27)	.53 (.24)	.46 (.18)														
Empower	.64 (.16)	.55 (.19)	.52 (.19)	.51 (.19)													
Face to Face	.83 (.32)	.69 (.31)	.67 (.21)	.59 (.23)	.69 (.29)												
Goal	.72 (.20)	.58 (.25)	.55 (.25)	.59 (.26)	.53 (.19)	.66 (.25)											
Government	.84 (.41)	.64 (.31)	.51 (.19)	.54 (.24)	.51 (.19)	.65 (.24)	.60 (.23)										
Inward focus	.87 (.36)	.76 (.37)	.71 (.27)	.64 (.22)	.70 (.25)	.84 (.40)	.71 (.26)	.68 (.25)									
Management	.81 (.36)	.66 (.29)	.57 (.20)	.56 (.23)	.62 (.24)	.72 (.29)	.65 (.21)	.64 (.25)	.78 (.35)								
Mentorship	.81 (.27)	.61 (.28)	.56 (.18)	.66 (.32)	.67 (.31)	.79 (.37)	.65 (.23)	.64 (.24)	.78 (.27)	.77 (.41)							
Networking	.83 (.33)	.71 (.32)	.68 (.23)	.58 (.24)	.66 (.26)	.88 (.43)	.62 (.25)	.64 (.26)	.81 (.37)	.69 (.33)	.72 (.30)						
Physical Environment	.69 (.28)	.50 (.24)	.54 (.27)	.47 (.22)	.28 (.17)	.59 (.24)	.56 (.24)	.52 (.25)	.63 (.23)	.63 (.26)	.56 (.23)	.61 (.24)					
Public Health	.43 (.14)	.31 (.17)	.27 (.18)	.31 (.17)	0 (.15)	.35 (.16)	.35 (.17)	.40 (.20)	.37 (.16)	.35 (.17)	.35 (.17)	.34 (.16)	.32 (.16)				
Self-Presentation	.76 (.31)	.66 (.28)	.62 (.22)	.64 (.24)	.57 (.19)	.69 (.29)	.69 (.31)	.61 (.22)	.74 (.33)	.71 (.26)	.69 (.23)	.66 (.30)	.57 (.22)	.35 (.13)			
Side Business	.59 (.09)	.49 (.15)	.50 (.18)	.39 (.16)	0 (.18)	.56 (.14)	.50 (.19)	.49 (.13)	.55 (.12)	.49 (.14)	.57 (.18)	.62 (.18)	.48 (.14)	.27 (.15)	.52 (.12)		
Sponsorship	.59 (.23)	.52 (.26)	.40 (.21)	.43 (.21)	3 (.23)	.53 (.22)	.53 (.22)	.47 (.22)	.56 (.27)	.65 (.41)	.49 (.22)	.52 (.28)	.43 (.23)	.23 (.17)	.58 (.24)	.34 (.15)	
University Partnership	.75 (.25)	.72 (.34)	.51 (.18)	.52 (.20)	.48 (.18)	.61 (.19)	.48 (.19)	.58 (.27)	.64 (.19)	.55 (.20)	.60 (.21)	.62 (.23)	.48 (.19)	.33 (.16)	.60 (.17)	.44 (.16)	.43 (.19)

Third, using what the literature details about key entrepreneurial skills (Peschel et al., 2020), the codebook was again examined for confirmations any possible omissions, and new understandings. NVivo was employed to perform word queries using not just exact words, but also accepted meanings of words to double check any conclusions of absence. Fourth, to confirm coding conclusions as to which themes were most important to the participants, percent representations of strongly correlated and overlapped word similarities among nodes (as defined above) were calculated (Table 4).

Table 4

Percent representations of strongly correlated and overlapped word similarities among nodes

Code	Frequency (x/58)	Percent representation
Barrier	11	18.97
Inward focus	10	17.24
Face to Face	6	10.34
Networking	5	8.62
Management	5	8.62
Mentorship	5	8.62
Community	4	6.90
Self-Presentation	3	5.17
Empowerment	2	3.45
Goal	2	3.45
University Partnership	2	3.45
Creativity	1	1.72
Education	1	1.72
Government	1	1.72
Physical Environment	0	
Public Health	0	
Side Business	0	
Sponsorship	0	

Fifth, each case was recoded using the lens of ELT (Kolb, 1984). Researchers therefore used the general a priori categories of knowledge and experiences to guide the final level of between-case coding and the results are listed alphabetically in Tables 5 and 6.

Table 5

Inter-case theme intersections with ELT: Knowledge

	Theme	Specific Theme Focus/Description
What knowledge is revealed by incubatees as necessary?	Business	Planning and maintenance
	Communities	What communities have, need, and want.
	Feedback	Giving and receiving among peers and with management.
	Generating Questions and Ideas	How to develop a questioning mindset.
	Interests	Cultivation of a wide variety of interests.
	Money	The value of money and how to manage money.
	Observation	How to make good observations, become a good observer.
	Reasoning	Deductive and Inductive
	Reflections	How to use data and experience to reflect and use these reflections to make good decisions going forward.
	Resources	How to identify and prioritize needed and wanted resources.
	Teamwork	How to work with a variety of people toward one goal or different goals.
	Time Management	How to organize and utilize time.

Table 6

Inter-case theme intersections with ELT: Experiences

	Theme	Specific Theme Focus/Description
What experiences are common among incubatees?	Failure	Failure in business; failure in personal life.
	Risk Taking	Taking financial risks; experiencing far-reaching implications into personal life.
	Continual learning	Being a learner in many different contexts.
	Active interpretation of lived experiences	Taking consistent time to consider an experience and place it in their current personal schema – both regarding business and personal life.
	Creating	Creating is an experience directly links to a feeling of empowerment for the entrepreneur.
	Process	Engaging in the processes of creating, building, learning, etc; Process is valued as much as product.
	Networking	Engaging with other people, specifically in a face-to-face modality, toward information exchange or creating contacts for the purposes of business and/or personal support.
	Peer engagement	Like networking, includes peer critique.
	Designing	The process of designing solutions, artifacts, products, results.
	Deciding	Weighing complex data to settle on a course of action.
	Pivoting	Ability to change focus or pathway in response to few resources or other perceived barrier; also, flexibility.

Finally, all data were triangulated by researchers using cycles of discussion guided by Shulman's definitions for surface, deep, and implicit structures to characterize the entrepreneurial hallmarks and practices of study participants.

Throughout the research process, researchers kept a detailed record of all data collections, coding meetings, and revisions. NVivo software enabled organized storage and maintenance of all audio and transcript interview files, research queries, coding, annotations and reflexive memoing for each researcher independently and as one merged study file.

Results and Discussion

Acting on the premise that entrepreneurship is a highly experiential profession that includes skills that can be taught and responding to the call for a signature pedagogy for the profession, researchers listened to the voices of actual entrepreneurs to reveal the surface, deep, and the implicit structure of their craft (Shulman, 2005).

Surface Structure

Entrepreneurs clearly stated their immediate, overt goals and needs in response to researcher inquiries. Overwhelmingly participants agreed that financial support was an immediate, pressing, consistent need to achieve their goal of making money but not all participants articulated the desire to be "wealthy". Instead, they discussed the desire to support themselves while enjoying what they were doing.

I like the culture of [non-hub incubator location]. [Large hub] is a little too busy for my personal preference, personal taste. [non-hub incubator location] has a good culture, but a small-town feel. (2-FG1)

In other words, job satisfaction, living where they wanted, and independence/freedom tended to be as important as financial outcome and this result is consistent with what others have found (Ashta, 2015; Cassar, 2007; Why MBA entrepreneurs are happier than their peers, 2012).

Another consistent need expressed across groups was a place to work that provides a comfortable place to be creative, design and do, engage in new experiences, and try new things. For example:

[What I need is] A large venue - having this open room over here. Working over here if I want quiet, it's a good spot. ... We had the interview room, the computer lab was being used, this room was being used, so definitely a diverse set of places to work with here, so infrastructure wise- it's been really great. (1-FG2)

Well, there's an outside space under a shed, and we could do hot work out there. We could weld out there, we could have a forge, we could do hot, dirty work outside the building, and I agree that the interior of the building needs to be left alone, but there's a shed out back, and I've already checked it out. I'll have to pull some electrical, but you know, I think we could do that. (1-FG4)

The work location should also provide ready access to equipment and supplies that may be in short supply or missing:

Computer labs are great, software that they have available for us that is expensive software is sweet, and we can't afford it, so it works really well for us. (2-FG2)

We need big doors... and a sixty-watt laser cutter...and an overhead door... and a giant white wall. and accessibility to public transportation. (6, 1, 2, & 8- FG 3)

As also reported by Greenberg and Mollick (2018), entrepreneurs in this study want to be the “master of their own destiny” but acknowledge the need for people to help them achieve their goals. Across cases, entrepreneurs articulated the need to be around people they can trust who can help them achieve their goals – personally and professionally.

Honestly, we're dreamers, you know, and we want to put our hands to the work to accomplish and achieve the dream that we have for ourselves. So, for me, I need this. (7-FG3)

And [the incubator] doesn't have the value... If all of us are not there... Helping each other. (1-FG3)

The people that were kind of in it for themselves... they get pushed out... They kind of realize this is more of a place of working together, and kind of building relationships... and they end up leaving. (3-FG2)

Overwhelmingly, participants in this study only talked about meeting face-to-face. They articulated the need not only to be around people, and to “know the names of the places and people” (2-FG2). When the research team specifically inquired about online opportunities to meet and connect, the participants were not positive about this prospect.

A subject matter that's more straightforward I wouldn't mind a webinar, but something more complex, where, maybe, I'm new to it and I need a lot of questions, that's something were I wouldn't want to take a webinar or skype class. (4-FG2)

If it is something where you're going to have a lot of questions, it's pretty good to do that in person. (1-FG2)

Participants indicated that the incubator manager is oftentimes the first person and main person of connection. This person should have experience being an entrepreneur and bring experiences, training, networks, and wisdom to the table to be shared. For example, several tenants in FG-1 expressed the desire for management to find a way to bring “more businesses [in the incubator]” along with “experts from industry”. Tenants in FG-2 and FG-3 echoed these sentiments, citing the need for “marketing professionals, lawyers” and “other business professionals” to make their services available on a regular

basis while also suggesting that management should be “getting out and finding people that are successful, that are willing to speak at other things” (4-FG3).

So (incubator manager’s name) is an entrepreneur, [...] So, I mean we’ll talk to him. He’s right across the hallway from me, so I’m able to talk to him on a day by day basis, at least, about something that’s going on with the company. He sits on our advisory board, and so that knowledge is great. (Second incubator manager’s name) she’s the marketing person. She has a lot of experience with marketing, so every now and then, I’ll go run something past her real quick. (3-FG2)

In summary, entrepreneurs in this study made their needs and goals clear. A safe place with a variety of workspaces, equipment, and other supplies where members may experiment, and work is essential. In this space, there should be people: to rely on, to learn from, to learn with, to fail and succeed with, and to network with. A knowledgeable, experienced space manager should be actively involved and able to facilitate a variety of learning opportunities for the incubatees.

Deep Structure

The participants revealed an entrepreneurial culture predicated on face-to-face interactions and characterized by doing, designing, discovering, connecting, collaborating, welcome-ness, empowering, building, brainstorming, problem solving, making, and impacting. The entrepreneurial culture is one of action and reflection where a person feels accepted and important; valued for who they are and what they can offer. As one participant stated: “I want to be around people who will strengthen my ideas and my knowledge. It is like iron sharpening iron” (2-FG3).

This culture was described by many participants as a “safe” space – a place where failure is ok and expected; where failure is not the end, but yet another beginning. The space is also safe because while oftentimes working alone in their particular entrepreneurial ventures they have (and value) the opportunity to learn from and walk with others who are just as inquisitive as they are.

I think it’s a safe place to fall. Like professionally in your job, you kind of have to cut in line, and you don’t want to step out of the box, because you might make a mistake, but when I’m down there, if I put a board down, I got my measurements wrong, I can just flip it over, because they [fellow incubatees] taught me that. (3-FG3)

Analysis revealed participants’ connection of a culture of safety with the ability to “be themselves” in an unbiased community that they oftentimes spoke of as “family”. As indicated by participant 3 (FG3), “The synergy [in the incubator] is inspiring.”

[...] you don’t run into a lot of people who are [just as clueless and as terrified as me] and if you don’t [meet these folks] it can feel very isolating. (1-FG1)

In summary, this study indicates that the deep structure of entrepreneurship fosters a sense of connectedness among individual entrepreneurs as well as between individuals and their community.

The result is a sense of synergy that empowers the individual and provides a necessary framework of support on which to build persistence and resilience.

Implicit Structure

According to Shulman (2005), the implicit structure of a professions refers to the values, attitudes and dispositions of its professionals. Data indicate that active entrepreneurs embrace the values of trust, diversity, respect, connectedness, and equality. Implicit in their conversations was the celebration of like-mindedness when it comes to being entrepreneurial but also diversity of backgrounds and ideas that could bring new perspectives toward solving problems or designing solutions.

We're people from all sorts of socioeconomic background and experiences in this city, and I know I can bring anyone here and they'll be welcome and feel a part of it pretty quickly. (2-FG2)

Across cases data revealed a very strong cultural pattern of willingness to be part of not only the incubator community but also the non-hub community at large:

It's an easy concept to weave. And, I hope to engage as many young minds, as well as old minds in the future, because in urban settings, you don't have the space. (11-FG3)

It's about sharing your personal experience. (1-FG3)

Throughout the conversations was a foundation of trust among members on which they depended to: 1. Hear truth about their entrepreneurial endeavor(s), 2. Be exposed to different ideas to use as a springboard for inspiration and new ideas, 3. Find the courage to continue during tough times. Interestingly, the idea of trust was linked 100% of the time to the necessity of face-to-face relationship across cases. Entrepreneurs in these non-hub contexts value handshakes and fist bumps, looking someone in the eyes, knowing family and friends of other members, and personal reputation. Trust also was the main factor in achieving connectedness among members and with community.

I think just the individual different [work] stations [in the incubator] are inspiring me to see what people are working on, and you know, the atmosphere of trust. I'm not going to go over there and mess it up or anything, but I can stand and see it - this is really cool. I think I might go and try this, because I see her idea. It's like a springboard (3-FG3)

Across cases, entrepreneurs valued the opportunity to work alongside others who were from different educational, socioeconomic, and cultural backgrounds. Their perception of the field of entrepreneurship is a place where all people can thrive, and none are "better" than others. Being connected with each other in a meaningful way provides an equality of opportunity that entrepreneurs value.

Well, I think it's that they're like minded, and then differently minded in a sense...So, they don't have to believe what I believe from a social, political or anything like that, but I think they have to believe that, I don't know if it's arrogance or stupidity that they can actually create something. And, that tends to be a common theme, and an unspoken one where, if you speak

with someone that has a more traditional job, I think there's a small but measurable difference in their belief structure about risks that they take, when they pursue their life, and that people that pursue entrepreneurial, I think, act differently. (2-FG1)

In summary, data indicate that the entrepreneurial culture is one that is built on trust and mutual respect. Diversity of perspective, experience, background, and culture is valued and celebrated. Equity and equality are essential to the innerworkings of this culture.

Conclusions

This study was concerned with listening to a purposefully selected group of entrepreneurs who are members in non-hub business incubators in the southeastern U.S. Through their conversations, study participants revealed knowledge, skill, and culture that are essential to being an entrepreneur.

Analysis resulted in a list of 12 things to know and understand as entrepreneurs according to our participants (Table 5). In addition, 11 common experiences were revealed by participants (Table 6). The experiences were inclusive of all seven key entrepreneurial skills published by Peschl et al. (2020) with the addition of "risk taking", "networking", and "deciding". The entrepreneurs valued experiential opportunities to transcend disciplinary boundaries and celebrated curiosity as a key component of their entrepreneurial success. Finally, for our participants, entrepreneurial culture is characterized by face-to-face interactions among individuals from diverse backgrounds and professions. The interactions may be intentional as well as incidental – but the key element is in the face-to-face aspect. It is a culture of trust, teamwork, collaboration, and empowerment that engenders a sense of belonging in the entrepreneur. Both the individual and the collective is celebrated. Deep connections exist among entrepreneurs and between entrepreneurs and their community.

Research Implications

Building from the study results, it is possible to theorize how primary and secondary teachers can best support the training of future entrepreneurs.

The Design Process

When considering the surface, deep, and implicit structure of practicing, incubated entrepreneurs in a non-hub context, the design process is a point of convergence. Designers have a distinct way of interacting with the world that aligns with the implicit and deep structures of learning revealed in this study. According to Cross (1982), there is a hallmark "designerly way of knowing" (p. 226) that, when considered in light of this study, overlaps with that of the entrepreneur. Designers and entrepreneurs are focused on problem solving and doing; creating and building; thinking about solutions and persisting toward the goal; bringing abstract into concrete. Entrepreneurs, like designers, value feedback and working in collaborative endeavors.

The experiential nature of the entrepreneurial practice was also a point of emphasis and convergence, as revealed by study data. The participants described their daily involvement in iterative cycles of

connected experiences characterized by success, failure, reflection, thinking, discussing, considering, and doing. Interestingly, participants in this study all chose to be in an incubated context and valued support and guidance by the incubator manager in specific, as well as other incubatees. The parallel of the incubated entrepreneurial context with an experiential learning classroom was noteworthy to researchers and provided support for the possible success of classroom training of future entrepreneurs with the teacher acting as “manager” and students as “incubates.” The structure of this classroom would certainly need to reflect a successfully functioning incubator that provides each student a place to work that aligns with the revealed surface structure in this study. Additionally, for many, the teacher as manager may require a shift in teaching mindset to align with functioning as coach rather than in more traditional roles.

In summary, results indicate that the elementary or secondary classroom may be an authentic context in which to prepare entrepreneurs and the design process should be considered as a central tenant to any signature pedagogy for entrepreneurship education, where students should be intentionally and explicitly engaged in the design process throughout their learning career.

A Design-Based Pedagogy

In order to effectively prepare entrepreneurs, results from this study support prior assertions that students should be engaged in gradually more complex, transdisciplinary, experiential learning opportunities that incorporate the common knowledge and experiences that actual entrepreneurs face (Gold & Kerly, 2019; Haase & Lautenschlager, 2010; Higgins et al., 2013; Peschl et al., 2020). To bring clarity; therefore, to a meaningful, authentic teaching approach for entrepreneurship, the pedagogy must provide a pathway toward achieving specific learning outcomes. This study reveals that “designerly ways of knowing” are one such outcome. However, to be actually utilized, the pedagogy must also provide a framework that supports the learning standards identified by schools, districts, and states. Finally, any signature pedagogy should intentionally include a learning context that is informed by the deep and implicit structures of the entrepreneurial culture in which students can practice their cognitive skills toward mastery.

Within the design fields, there is already consensus building regarding a signature pedagogy that is being successfully utilized to achieve “designerly ways of knowing”. The design studio is a place of similarity among designers (including, but not limited to artists, architects, and the like) and in schools of design worldwide (Crowther, 2013). There are many characteristics of the design studio that researchers have agreed upon as distinguish it as a signature pedagogy such as the flexibility in space to support creation, modeling, doing, experiential learning, failure, dialogue, critique, presentation or performance, and engagement with the design brief (Bohorquez, 2012; Crowther, 2013; Schön, 1984; Schrand & Eliason, 2012; Shreeve et al., 2010). This ubiquity in use and focus supports the identification of its use as a signature pedagogy with design fields (Shulman, 2005). When considering the results of this study, educators in university or upper secondary school, where students are being more explicitly prepared for entry into the workforce, should also consider embracing the use of the design studio as a signature pedagogy for entrepreneurship education.

For the purposes of general education, though, especially in elementary, middle, and early high school, it may be useful to embrace a comprehensive pedagogical approach that allows for the embedding of the above-referenced signature pedagogy of the design studio. An Integrative STEAM Educational (I-STEAM) approach is one such comprehensive pedagogy.

An I-STEAM pedagogy is one that is rooted in inquiry where the content and practices of Science and Mathematics are intentionally applied through the design process in order to realize outcomes to ill-designed, relevant problems in either Engineering, engineering Technologies, or Art (Gess, 2015, 2017; Gess & D'Oria, 2018; Gess & Hargrove, 2019). This approach thus gives the educator the ability to create a contextualized, experiential learning environment based in design while simultaneously helping learners construct both disciplinary and transdisciplinary understandings. Research indicates that employing this student-centered, blended, design-based integrative approach positively impacts content knowledge, curiosity, knowledge transfer (Kennedy & Odell, 2014; Krajcik & Delen, 2017), critical thinking, problem-solving (Shanta & Wells, 2020), and community engagement (Traphagen & Traill, 2014). Additionally, when engaging in an I-STEAM classroom, research indicates that students and teachers report the creation of a unique sense of community, welcome-ness, and trust among all participants (Gess, 2021), an essential component of the entrepreneurial culture. By adopting and employing an I-STEAM pedagogical approach as a comprehensive pedagogy for pre-university entrepreneurship education, the classroom may be redesigned to provide all aspects of the educational structure articulated by entrepreneurs in this study and therefore may be an answer for the call for a unified framework toward equipping future entrepreneurs.

Strengths, Limitations, and Recommendations for Further Research

This study employed a focus-group case study design to reveal the surface, deep and implied work structures of the active, incubated entrepreneur with the intention of utilizing revealed data and understandings toward informing a unique pedagogical approach to training future entrepreneurs. Researchers were careful to improve strength of the study by ensuring that only practicing, incubated entrepreneurs participated in the focus group discussions (Miles et al., 2020). The focus group enabled researchers not only to hear the perspectives of the participants, but also to glean important information that resulted from the participant interactions that occurred during the sessions. However, participants from only four non-hub incubators from the southeastern US were engaged in the study, thus limiting the transferability of the study results. To deepen understandings, it is important to continue this kind of exploration with entrepreneurs in different contexts: hub vs non-hub, other regions of the US, countries outside the US, etc.

Revealing the surface, deep, and implicit structure of incubated entrepreneurial practice was the focus of this investigation. However, what impact does non-incubation have on entrepreneurs? Taking time to repeat the study with non-incubated entrepreneurs is advised to formulate a more complete view of the above-referenced structural elements.

At the beginning of the process, investigators asked participants to engage in a drawing activity with the intention of triangulating the results from the drawings with the results of the focus groups in a later

study. In retrospect, the addition of individual interview of focus group participants to triangulate those results with the focus groups would improve the strength of data quality.

Teacher training should be considered for further study. How best to equip the classroom teacher to transform their practice into from teacher to entrepreneurial manager has yet to be explored. What is needed to empower teachers (who may not have ever been engaged in any entrepreneurial activities) to embody designerly ways of thinking and being, specifically within the context of entrepreneurship? What supports do these teachers need to transfer their learning into effective classroom presentations?

Finally, investigating the impact of employing an I-STEAM approach as a signature pedagogy for entrepreneurship education with specific regard for accepted learning and behavioral outcomes is an important next step. In addition, exploring whether an I-STEAM approach positively impacts the well documented gender differences in who becomes an entrepreneur (Kuppuswamy & Mollick, 2015) would be a valuable course of inquiry to inform the field. These studies should be completed in primary, secondary, and undergraduate classrooms to determine the efficacy of the approach across educational contexts.

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