An experiment in knowledge co-creation on the subsistence entrepreneurial ecosystem of metropolitan La Paz, Bolivia

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ABSTRACT

The Ecosistema del Emprendedor por Subsistencia Paceño, in Spanish, is a collection of books produced by the Bolivian Catholic University, with the active participation of graduating students involved in fieldwork research on a common topic of interest. Subsistence entrepreneurship is an important issue in a developing country context like Bolivia where it has not been studied from its ecosystem perspective. The collection concentrates mostly on the metropolitan area of La Paz. This article reviews the knowledge co-creation experiment among graduating students from different careers and their professors in studying and analyzing the La Paz's subsistence entrepreneurial ecosystem under conditions of research constraints.

Keywords: Subsistence entrepreneurship – Social entrepreneurial ecosystems – Research constraints – Research experiments – Knowledge co-creation

1. INTRODUCTION

The subsistence entrepreneurial ecosystem (SEE from now on) of the metropolitan area of La Paz[1] is composed of plenty of subsistence entrepreneurs and their small to micro-sized enterprises (generating close to 70% of employment) and plenty of stakeholder organizations like microfinance organizations, public and private technical institutes and universities, municipal and national government agencies, private firms with social responsibility programs, domestic and foreign NGOs, social entrepreneurs, and companies in firm services, social services and infrastructure services.

Households of urban subsistence entrepreneurs develop their daily small-scale activities in the competitive local markets in food and beverages, textiles and leather, woodwork and metalwork, handicrafts, basic electronics and information technologies, repair of all sorts, small scale transport and construction, and an immense portion in small scale national and international commerce. In addition, subsistence entrepreneurs in rural areas also include small scale agriculture, livestock, mining and a large rural-urban commerce that connects the city with several ecological systems. In all of these urban and rural markets their activities are mostly about exploiting marginal market gaps not profitable for larger-sized firms but also by exploiting profit opportunities through informality, and their business models are generally not financially sustainable in the medium to long term.

La Paz is certainly a busy metropolitan city, however, there is a knowledge gap about the density and quality of the SEE's interconnections and about the depth and quality of knowledge sharing and effective support interactions. There is a knowledge gap about the business models of subsistence entrepreneurs and how they are evolving within their SEE's. There is simply a general knowledge gap about how the SEE is structured and functioning in the metropolitan city of La Paz. One reason for these knowledge gap is the lack of tradition among SEE actors to hire research services, in part because research costs are out of their reach in general but also because of their own lack of knowledge about its importance for economic self-organization and decision making.

1 Includes the larger cities of La Paz and El Alto and the surrounding areas of Viacha, Achocalla, Mecapaca, Pucarani, Laja and Palca, with an overall estimated population of 2 million.

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The study of the effectiveness of an SEE is the study of a complex problem requiring different perspectives and the literature on entrepreneurial ecosystems is mostly based on the experience of industrialized economies in supporting innovative high-growth startups. For progress in the study of the La Paz SEE, knowledge would need to be generated based on own local context and accumulated experience. The study would need to be comprehensive and in-depth in its details and dynamics and performed over a long period of time, as opposed to shallow, static and sporadic. For example, knowledge generation on the La Paz's subsistence entrepreneurs in particular has been sporadic and mostly from the perspective of employment generation or its informality characteristic, and usually subsidized by a government office, a non-governmental organization or a university. Private companies involved in firms' services will not find research on SEE issues profitable.

Local universities have the required human capital and research capabilities for the task, although limited in numbers, however their activities are by far concentrated in knowledge transfer and much less so in knowledge generation given their financial constraints, and as a consequence universities are generally not well integrated to their local SEE and their research needs. There is however an opportunity to improve on this by implementing long-term low-cost research on SEE issues within the university system. This article is about the review of such an experience within the Bolivian Catholic University in La Paz. In effect, an experiment in low-cost knowledge co-creation began in 2017 among last year students from different careers interested in developing their graduation research on fieldwork-based SEE issues and their professors as tutors and reviewers, all under leadership of professor Barja. By 2020 the result has been a collection of five books[2] with 15 student authored articles written from different perspectives. This output can be freely downloaded from the university's academic repository http://repositorio.ucb.edu.bo/xmlui/handle/UCB/86.

It is important to notice that the experiment came about strictly as a response to the mentioned structural constraints, where the universities' concentration on knowledge transfer rather than knowledge generation is the bottleneck constraint. Thus the article is not about a new research method or a new approach more appropriate for the study of SEEs, but rather it is about the experience in testing a low-cost solution that allows for the production of knowledge given those research constraints. The knowledge co-creation experiment does have a methodology but it is limited to the mix of activities of capturing interested students from different careers, their research approach selection based on key universal ideas from the international literature on entrepreneurial ecosystems, the requirement of fieldwork-based research, the follow-up of research rules and processes, and the publication and dissemination experience. Thus the article's contribution is about how this particular mix or methodology has worked in producing the desired outcome of generating knowledge about a complex problem in a context of research constraints and about other benefits that resulted from the experiment.

> "This article reviews the knowledge co-creation experiment among graduating students from different careers and their professors in studying and analyzing the La Paz's subsistence entrepreneurial ecosystem under conditions of research constraints."

After this introductory section, the second section presents a short literature review on entrepreneurial ecosystems in order to capture key universal ideas as basis for defining a general research focus for the experiment. The third section explains the experiment's methodology in the form of complementary research approaches proposed to interested students, the characteristics of the call for research, the graduation research rules and processes and the publication and diffusion experience. The fourth section discusses the experiment's output in the form of a summary-example of what have we learned about the La Paz SEE which helps in the identification of future research needs. Finally, the last section evaluates the experiment as a mechanism for knowledge creation under conditions of research constraints and the possibilities for improvement.

2. LITERATURE ON ENTREPRENEURIAL ECOSYSTEMS

The evolving literature on entrepreneurial ecosystems (Mason & Brown, 2014; Stam and Spigel, 2016; Borissenko and Boschma, 2017) has as its key insights that entrepreneurship (i) is not about entrepreneurs alone but about entrepreneurs and their ecosystem; (ii) is not about government policies for private sector development but about a self-governing system; (iii) is not about individualism and market competition but about network collaboration and coordination for the benefit of all participating actors; (iv) it is the uniqueness of ecosystems that will provide businesses with sustainable competitive advantage. In summary, as Isenberg (2014) described it, an entrepreneurial ecosystem (EE) is a dynamic and self-regulated network among different actors (entrepreneurs and stakeholder organizations) each with own interests, however all actors must benefit for ecosystem sustainability. But what exactly are the benefits of an EE? In essence it is the sharing of knowledge of different sorts together with effective support interactions.

2 The fifth book is currently under review by a Publication's Committee which is the final stage before formal publication.

Emphasizing the network collaboration and coordination aspect, Motoyama and Watkins (2014) methodologically suggested that an EE should be analysed from the perspective of the strength, density and quality of interconnections among entrepreneurs, among key support stakeholder organizations and between entrepreneurs and those organizations within location context conditions. Emphasizing the self-governing system for the benefit of all aspect, an EE can also be analyzed from the perspective of the collective action literature given its characteristic of public good-dilemma, where "*everyone would be better off if everyone were to contribute*" (Ostrom, 1998), but failure is likely due to the free-rider problem given the existence of transaction costs.

Why study subsistence entrepreneurship through the lens of entrepreneurial ecosystems? It has been documented that this kind of entrepreneurs don't contribute to economic development (La Fuente *et al*, 2018) only high-growth startups do, based on their capacity to innovate and take risks (Stam & van Stel, 2009; Szerb *et al*, 2018). In effect, the motivation of subsistence-based entrepreneurs, that tend to appear massively in developing countries due to lack of quality employment opportunities, is the survival of their families through self-employment.

However, this type of entrepreneurship contributes to poverty containment and if it is able to scale up a bit can contribute to poverty reduction. This type of entrepreneurs in fact don't innovate but rather tend to exploit marginal market gap opportunities at low or no risk, and in the process and overtime they develop a culture of independence, adaptability, hard work and resilience, along with many success stories (Tassi, 2017).

Isenberg (2011) makes a particularly useful distinction between self-employment and entrepreneurship which helps to narrow even further our focus: "*Entrepreneurship is aspirational and risk-taking, and intrinsically contrarian. Self-employed per se, is not entrepreneurship: self-employment-plus-aspiration, usually is; aspiration is the continental divide between the entrepreneur and the non-entrepreneur*." For aspiration Isenberg means the entrepreneur's business growth dream, which helps understand persistence and resilience, in addition to the dream of the self-employed limited to the wellbeing and future of their family.

Emphasizing the self-employed-plus-aspiration aspect, the subsistence entrepreneur with business growth aspirations would pay attention to its business model. A business model "*is a description of the value a company offers to segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value, in order to generate profitable and sustainable revenue streams.*" (Osterwalder, 2004). While the uniqueness of a local EE is thought to provide businesses with a sustainable competitive advantage, their business models are thought to ensure their financial sustainability and the potential for further business model innovation. Thus the study of business models of subsistence entrepreneurs and of themselves should provide information on the entrepreneur's interest on their local SEE.

3. METHODOLOGY

This section explains the methodological aspects of the knowledge co-creation experiment expressed in the call for research, the research proposal to students, the graduation rules and processes and the publication and diffusion experience.

3.1. The call for research

The first call for research on the La Paz subsistence entrepreneurial ecosystem was launch in the middle of 2017 with very specific characteristics: It was directed to graduate and undergraduate students from different careers who were in need to begin their graduation research, who were actively looking for a research theme and tutor, who might be interested in developing fieldwork research on a topic of their choosing within the La Paz subsistence entrepreneurial ecosystem and following the same graduation research rules and process of the *Escuela de la Producción y Competitividad* (EPC)[3], and after successful completion the offer of publication as a chapter in a book. A graduation research rule allows students to develop their research alone or maximum in pairs.

3.2. The research proposal to students

The research proposal explained to interested students was a choice between two alternative basic approaches to analysis: (i) the study of a particular subsystem within the ecosystem, emphasizing on the actions of involved stakeholders; or (ii) the study of a business model within a particular economic activity, emphasizing on the actions of involved subsistence entrepreneurs; (iii) both were presented only as starting point approaches and students were allowed to introduce own variations as they went along in developing their research proposal.

3 EPC is an academic unit within the Bolivian Catholic University in La Paz, that administrates three undergraduate programs (international businesses, creation and enterprise development and finance engineering) and three master level programs (business administration, business finance and public policy).

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A key decision behind the two approaches was to avoid writing one big research document about the entire La Paz's SEE that would only generate superficial knowledge, but rather to decompose it in its multiple "pieces" to ensure depth. Later, by the accumulation of knowledge through many research papers, the overall ecosystem "puzzle" could be built.

Another key decision was to promote fieldwork-based research with significant interaction with actual subsistence entrepreneurs and stakeholder organizations. Theories could be developed much later once there was a critical amount of accumulated knowledge. This didn't mean the avoidance of literature reviews on either theoretical or practical knowledge on a selected topic, which was promoted. Its purpose was to ensure that interactions with local actors through fieldwork would provide the needed local perspective and experience.

> "There is a knowledge gap about the density and quality of interconnections, about the depth and quality of knowledge sharing and effective support interactions and about the structure, functioning and business models within the subsistence ecosystem of the metropolitan city of La Paz."

Another characteristic was that, under both approaches, no restriction were imposed on the lifetime of the participating ecosystem actors, either of old or recent creation in the case of organizations and early stage or established in the case of entrepreneurships. The idea was to simply work with what existed.

3.2.1. The subsystem approach

Regarding the first approach, an entrepreneurial subsystem is referred to those of entrepreneurial education services, financing services, technical assistance services, information services, innovation and technology transfer services, government policies and regulation services, basic infrastructure services and firm services, all of which are available to early stage entrepreneurs or established businesses regardless of the economic sector of their activity.

Under this approach emphasis was on mapping stakeholder organizations within a particular subsystem, and analyzing the interconnections among them and with subsistence entrepreneurs. Students had to choose only one subsystem to concentrate on, then they were asked to select a specific theme within their subsystem of interest or analyze the subsystem as a whole. From the beginning it was suggested to them to interview some actors within their theme (organizations or entrepreneurs), which together with some literature review would help them in writing a research proposal.

A first part of the research output would be descriptive about how the subsystem worked within their theme and the main source of information would be planned interviews and/or surveys. Description would result in the identification of different types of functioning problems. A second part would consist in that students would develop a proposal about how to improve the functioning of the subsystem from the perspective of their selected theme. Depth of their proposal would be consistent with depth in identified functioning problems. A third part would be about testing their proposal with the organizations and entrepreneurs themselves with whom contact had been made. It would be a qualitative testing with the sole purpose of correcting and improving their proposal by taking into account the opinion, criticism, feasibility and suggestions coming from subsystem actors themselves. The final product would be a research paper that generates knowledge about the functioning of a subsystem, their main functioning problems, possible solutions and all based in consultation and participation with ecosystem actors through fieldwork.

3.2.2. The business model approach

Respect to the second approach about studying the business models of subsistence entrepreneurs, students were asked to select and concentrate on a small group of subsistence entrepreneurs producing the same product on a particular selected area of the metropolitan city. From the beginning they were also asked to have an early general contact and interview with those entrepreneurs which, together with some literature review, would help them in writing their research proposal.

A first part of their research output would be descriptive of how the business model functioned within the selected economic activity, group of entrepreneurs and product, with planned workshops with entrepreneurs themselves as the main source of information. This part would have a joint discovery character resulting in a description of the actual business model in operation, where students would guide the workshops using as a reference some academic model (for example, the business model canvas of Osterwalder and Pigneur (2010)) and the entrepreneurs would participate providing the required information based on their experience. Description would result in the identification of gaps and functioning problems of all sorts.

A second part would be about developing a proposal about how to improve the functioning of the actual business model. Again depth of a proposal would be consistent with depth of

their problem identification. And a third part would be about testing their proposal with the group of entrepreneurs themselves by planning workshops again. This is also a qualitative testing with the sole purpose of correcting and improving their proposal by taking into account the opinion, reaction, criticism, feasibility and suggestions from entrepreneurs themselves. The expected outcome would be a research paper that would generate knowledge about how the business model worked for a particular economic activity, its main problems, possible solutions and all based on an important degree of consultation with subsistence entrepreneurs themselves through intensive fieldwork.

Notice that both approaches incorporate some degree of intervention given the required degree of interaction with actors through fieldwork, possibly being higher under the second approach (business models) compared to the first (subsystems). However, intervention is limited up to the testing stage, after which actors can choose to partially or fully implement the research recommendations and independent of it actors would gain a tailored study. Nevertheless, it was predictable that tutors needed to pay particular attention and support to students' "interaction experiences," from their planning to their feedback loops.

3.3. Graduation research rules and processes

EPC has its rules regarding length of time and general characteristics for graduation research. Undergraduate students take two semesters of a "graduation work" course. At the end of their first semester they are expected to at least have an approved research proposal. During the second semester they fully develop their proposal ending with an approved final draft. Only the dates for defense are left out.

A tutor is selected by students among EPC professors to follow them during both semesters. A different professor is in charge of the graduation work course itself, who also follows them during both semesters. This professor also organizes dates for research progress presentations where other EPC professors are invited to provide further suggestions. Once the research is approved as a finished draft by the tutor, it is formally sent to a second reviewer; a professor who studies the document and prepares observations for the defense date. Three professors participate in the defense date: the tutor, the second reviewer and a third professor in representation of the EPC Director. All observations are required to be considered by the student in their final version to be hand-in within the next ten days after defense.

In the case of graduate students, the process is similar but much shorter in time. They have a two-month course called "graduation work" were they fully implement an already approved proposal developed earlier with their selected tutor while they are taking their second-year courses. Students are encouraged to develop a practical-based type of research, similar to a consultancy for a client, with the restriction that the research proposal must be feasible to be fully developed during those two months, ending in an approved final draft. The graduation work course professor also follows all students and halfway organizes a research progress presentation were other professors are invited for further suggestions. Only defense dates are left out and the defense itself follows the same process explained above until the student produces the final version.

3.4. The publication and dissemination experience

The output is composed of a collection of five volumes so far, containing a total of 15 articles in Spanish. Formal presentations from students, authors of the different book chapters, were made in planned academic events within the national UCB system (La Paz, Cochabamba, Santa Cruz and Tarija). Free printed versions of the books were distributed at the end of each presentation and free download digital versions were placed permanently in three academic networks: *researchgate*, *academia.edu* and *repositorio.ucb.edu.bo*.

Figure 1: A collage of book presentations by students

4. A SUMMARY-EXAMPLE OF THE OUTPUT'S CONTENT

This section presents a summary of what have we learned about the La Paz SEE as an example of the book's collection content but also to help in the identification of future research needs, as another output, which could not be done otherwise.

4.1. What have we learned about the La Paz SEE

The following four main issues stand-out from the accumulated research contained in the book collection: (i) entrepreneurial interconnections among actors of the ecosystem; (ii) finance practices; (iii) technology transfer and innovation practices; and (iv) the profile of subsistence entrepreneurs. In what follows a brief explanation of these issues is presented, noticing that knowledge generation is still partial but also pointing out that the articles generated much more information than what is summarized here.

Respect to the first issue, there is weak or lack of interconnections among ecosystem actors. Stakeholder organizations and subsistence entrepreneurs are there, but due to interconnections failures the ecosystem is far from working properly and actors are not benefitting from the potential impact on better quality business development. In part this is due to information, communication and coordination problems, but also lack of financial resources, human capital and culture in collaborative work based on trust and agreements. As a result, stakeholder organizations tend to work individually and contribute that way to the whole, without necessarily visualizing other stakeholder organizations and the entrepreneurs themselves. However, it is observed that when there are at least partial interconnections between entrepreneurs and key stakeholder organizations, results can make a difference for subsistence entrepreneurs, thus efforts to communicate, coordinate and cooperate seem to pay off. Nevertheless, the problem remains in that the benefits of interconnections may not be the experience of the majority of subsistence entrepreneurs.

In a developing country context, the government is a key actor expected to create the conditions for SEE development by its policies and actions through specialized offices (programs and projects), and regarding the metropolitan city of La Paz alone it was found that the government does in fact have all of those in place considering its national, departmental and municipal levels. However, it was also found weak or lack of interconnections among levels of government and between government specialized offices and other actors of the SEE. That government effort is concentrated in training and technical assistance mostly directed to SMEs and even larger-sized firms and therefore attention to micro subsistence entrepreneurs in practice is not high in their agenda (except for the municipal level), and also there are no impact evaluations of these efforts. Finally, when a small experimental survey to 103 micro and small entrepreneurs of different economic sectors was implement-

ed the result was their scarce knowledge of government programs from all three levels and even a lesser number having applied and/or had access to them.

Respect to the second issue, it has been found that subsistence entrepreneurs finance their early stage entrepreneurship from family sources or own savings, and not from microfinance organizations or from personal debt. However, they might work with microfinance organizations at a later stage once their businesses have proven profitable at small scale, when all operational issues have been worked out and if there is interest or even the possibility of scaling up. These findings suggest that family plays an important role in financing and absorbing losses in early stage subsistence entrepreneurship. Family is not normally considered an ecosystem actor, but here it is. At the same time subsistence entrepreneurs in general, and vulnerable woman in particular, have great need for basic budgeting, accounting and financial education, and a teaching experiment revealed that training must be stripped out of abstract concepts, concentrate on a few useful practical ideas and instruments, and deliver them using a learning-by-doing approach and games.

> **"The student's interaction experiences during their fieldwork were probably best captured during formal research presentations and defense, where most of them expressed how emotionally hard it was to face certain realities but at the same time thanked us for the opportunity of having lived such experiences."**

Respect to the third issue, it is found that entrepreneurial education as well as technology transfer and adoption, and digitalization and innovation, is lagging significantly particularly in technical institutes which are a key stakeholder in this regard for subsistence and small entrepreneurs. Small entrepreneurs seem to be benefitting from technology transfer by adopting practices learned in their previous jobs in larger-sized private firms, but also from inherited knowledge from their families. A culture of innovation doesn't exist by definition as subsistence entrepreneurs concentrate in finding simple low-risk opportunities as their main strategy to add to the family businesses, individually managed, regardless of increasing competition and low profits. It was also found that a culture of innovation doesn't really exist among SME's and even the larger-sized exporter firms who tend to understand innovation as any effort at improving product quality as main strategy for market expansion and greater scale.

In summary, the La Paz SEE functioning profile seem to be characterized by deep disconnections between subsistence entrepreneurs and stakeholder organizations and among stakeholders, but where at least some partial connection improvements does seem to pay off, where family plays a key role in the transfer of knowledge and seed capital, where technical institutes might be obsolete rather than a source of innovation, where sources of some change might be coming from the larger-sized private sector firms without them planning it, where there isn't really a culture of innovation regardless firm size and where government's actions in training and technical assistance don't seem to have any real impact.

Respect to the fourth issue, the profile of an average subsistence entrepreneur in urban La Paz, based on descriptive statistics from survey data, can be described as a female of age 34-41 with primary education level or less; being in the business of selling food and beverages as sole proprietor and sole source of income; who uses cellular as key mode of communication in their activities and considers having an Internet connection and own transportation as irrelevant for their activities; whose business is 5-10 years old but who cannot save on average; whose seed capital came from family sources or own savings; who is aware of the existence of financial services but doesn't use them because doesn't want to contract debt; and in case of having contracted debt from a financial organization their opinion of the quality of service is high.

However, when computing the probability of survival with a logit model based on the same data, that probability is positively associated to adults with age within 26-33 and 34-41 (in that order) regardless of sex, with operating businesses in the clothing and food sectors (in that order), with having completed more levels of education within high school, with their use of cellular, with having some bank savings, with having low levels of debt, and if their seed capital came from family sources or own savings.

The case of working street children and young adolescent describes an extreme case of survival in urban La Paz, who in fact develop entrepreneurial skills early in their life regarding leadership, risk taking, creativity, negotiation, autonomy/independence and need of realization (resilience). The case study of a local social entrepreneurship (ALALAY) informs of how these children are helped in their reinsertion to society which also shows a healthy society that helps its own.

The case of subsistence women entrepreneur in rural La Paz involved in milk production and their derivatives also describes an extreme case of survival. Except for strong family networks (particularly in support of their first businesses), plus their entrepreneurial attitude and knowledge of local rural markets, the rural ecosystem tends to work against them in several key

dimensions; like their local rural cultural practices regarding gender roles and responsibilities; their very low levels of basic education and entrepreneurial training; not having own initial capital (56% on average) and facing access barriers to financial services (guarantees) which are alleviated only by access to family capital; having occasional support from an ecosystem organization (19%) other than family (17%) while no support at all experienced by the majority (64%); their low access and training in the use of new technologies; their understanding of innovation associated to product quality and product quality associated to government regulations.

All of the above findings were concentrated on the subsistence entrepreneur experience, however several papers in the book collection also touch on the experience of some small to medium-sized enterprises and, on the other extreme, even the case of probably the most sophisticated entrepreneurs Bolivia has to offer in the growing software industry ecosystem, all of which tend to show very different own characteristics and behavior. This suggests that subsistence entrepreneurs coexist with a wide continuous range of types of entrepreneurs, however, actual interconnections among them, beyond coexistence, are unknown.

In effect, we have learned that the average profile of entrepreneurs operating in the novel software sector can be described as a middle-aged engineer in computer systems working for over a decade in software development following international business models and competing for clients in international markets, who is certainly not a subsistence entrepreneur but does coexist with local freelancers in software who do have the subsistence characteristic. The ecosystem of this emerging sector is characterized by few actors with dense bidirectional interconnections among software entrepreneurs and between them and foreign companies specialized in software design, planning and quality control, but much less so with local organizations related to technological development like research centers and universities with whom their connections are unidirectional. At the same time, they are not connected with the local financial system given the software's sector high degree of intangible capital and the operational old ways of the former. Technology and process support is very important for software entrepreneurs and it happens through their connections with foreign firms and foreign clients. Entrepreneurs in this emerging sector might have created among the few Bolivian companies immersed in a culture of innovation with high development impact as well as significant high quality employment generation among urban young people, just as it is observed in other parts of the world.

4.2. Futures research needs

There is no doubt that much more needs to be researched on the same issues above just to have a better and complete picture on them. At the same time there are areas where there isn't much information yet:

(i) more subsystems need to be explained particularly the participation of stakeholder organizations in firm services of different kind, microfinance services, private investors beyond the family, information services and basic infrastructure services available for subsistence entrepreneurs;
(ii) more sectors need to be explained particularly those of light manufactures, agroindustry, digitalization and social enterprises;
(iii) actual business models of subsistence entrepreneurs need to be understood and potential business models need to be explored;
(iv) the attitude of subsistence entrepreneurs respect to the relation innovation-risk and market dynamics within their informal institutions need to be understood;
(v) the type and quality of connections among different types of entrepreneurs in the same economic sector needs to be explored;
(vi) also explore the existence of connectors (mentors, dealmakers, social entrepreneurs), their incentives and strategies for interconnecting entrepreneurs with key support organizations, as well as among entrepreneurs and among stakeholder organizations.

5. AN EVALUATION OF THE EXPERIMENT

This section develops a review of the experiment's methodology regarding the actual approaches to ecosystem analysis used by students, their preferred mechanisms of data collection, how much interaction with local actors did students experience in their fieldwork, the multidisciplinary characteristic of the experiment's output and other benefits.

The two basic approaches suggested to students for ecosystem analysis were in fact only taken as a reference as students' own variations became the norm. Only two papers followed the first approach of subsystems and perspective of support organizations, one analyzed the technical education subsystem and the other analyzed the government subsystem. While none of the papers followed the business model of subsistence entrepreneurs approach. The majority of them rather followed a mix of the two proposed approaches, that of the entrepreneurs' perspective of the ecosystem. This was the main variation introduced by students. Within this variation a student expressed her interest in studying the innovation subsystem

from the perspective of SMEs while other students expressed their natural interest in studying the ecosystem by economic sectors rather than by subsystems, also from the perspective of entrepreneurs. Two papers followed this last route, one analyzed the small restaurants sector and the other analyzed the software sector.

However, the majority followed a different path within the main variation introduced by students themselves and chose to analyze the following specific ecosystem themes, also from the perspective of entrepreneurs: the profile of subsistence entrepreneurs and their source of financing; an experiment in finance education for subsistence entrepreneurs; the potential of crowdfunding in SMEs; the insertion of vulnerable young into labor markets given that entrepreneurship is not for everybody; entrepreneurship among working street children; innovation culture among manufacture exporters; entrepreneurship among rural vulnerable woman; rural subsistence entrepreneurship; a social entrepreneurship case study related to street children; and use of digital marketing in a social NGO.

The required degree of student interaction with actors also varied. Firstly, no student developed their graduation research following the business model approach probably because it was perceived as too demanding in terms of the amount of interactions it required, even though many did express their interest at the beginning. Nevertheless, this result contributed as feedback to the content of EPC's own entrepreneurial education by reinforcing a deeper learning in business models. Thus, all research papers followed variations of the proposed first approach which may have been perceived as requiring a lesser degree of interactions, which might have been true in some cases but not in most. The student's interaction experiences were probably best captured during formal research presentations and defense, where most of them expressed how emotionally hard it was to face certain realities but at the same time thanked us for the opportunity of having lived such experiences. It was also observed that the actor's own collaboration, support and feedback to students was very important for completion of the student's research, however their presence was almost absent at the stage of book dissemination which resulted mostly as an internal academic event. Therefore, other ways to disseminate need to be explored in order to reach actors of the La Paz SEE to ensure the transfer of information to them as well as to collect their feedback.

An average of 10-15 EPC students per year expressed their interest on this line of research since 2017, but probably the most risk takers followed through, being 3-4 per year on average, and except for two, all students that got an accepted graduation research proposal did develop it to its end. These were students from the undergraduate programs in international business (2), finance engineering (2) and creation and business development (1), and the master programs in business administration (3) and public policy (3, two of them in pairs). Also since 2019, students from other UCB's programs began to add their research coming from the undergraduate programs in business administration (1) and commercial engineering (2). Other additions were a professor belonging to commercial engineering (1) and a professional journalist who wrote a case study (1). All of them contributed with a "piece of the puzzle" in terms of knowledge generation from a multidisciplinary perspective. While the original call for research was limited to EPC's careers and students, this result suggests that the call should be widened. It was also observed that the offer of publication was not the main hook to capture interested students, but rather the fact that there were two basic thought out approaches to a general theme suggested to them.

The data collection mechanisms also varied given the requirement of fieldwork-based research. Besides having constant guiding conversations with key actors within their selected themes, all students chose to implement either surveys (the majority) or interviews/focus groups, and several of them did both. In two cases the amount and characteristics of the data collected allowed for planned econometric estimation. A few of the articles may have had imperfections in their approach to information collection, either the amount of data or the amount of interviews executed, and therefore these were recognized more as experimental research by student themselves, while the rest had very good information collection and several of them have gone beyond expectations in this regard. However, this is a learning process where professors carry over the accumulated experience and it is them who must develop the appropriate research protocols particularly on information collection. Another aspect to stand out is that some of the papers crossed some research frontiers, for example, the inclusion of other large cities beyond La Paz (Cochabamba and Santa Cruz), or concentrating on the rural area of La Paz or concentrating on entrepreneurs beyond the subsistence level.

Today it is possible to say that we have learned many aspects of the La Paz SEE, some of those key aspects were presented in a previous section, but also that there is much more to be learned as other subsystems, economic sectors, ecosystem themes and business models are analyzed which we could have not known in advance. Also the dissemination of information and knowledge has benefited the academic community about how does the SEE works today, what are its main sources of failure and also generated exchange about its perspectives given potential possibilities for change.

There were several other secondary benefits that resulted from the experiment which are no less important or valuable: (i) It is helping the university to integrate better as a natural actor of the wider entrepreneurial ecosystem by contributing with academic research and knowledge generation, and it is helping the university to act as a bridge to the SEE in particular. (ii) It has taught the university that research can be done by students when professors have limited time given their heavy teaching load, in this case by students in their graduation research stage which is well regulated by the Bolivian Catholic University. Once more it was confirmed by this experience that students are always creative, pay attention to detail and are not afraid to go the extra mile. (iii) It has also helped students themselves, beyond the graduation requisite, by gaining a real life professional experience with real Bolivian issues and most importantly to have had contact with real world actors, plus they also gained by having a publication and several presentation experiences.

Finally, it is also important to mention that this is the type of experiment that could be useful in other Latin American countries and other developing countries, who can certainly design other methodological mixes more suitable to their own circumstances, because they are also interested in generating knowledge on their local subsistence entrepreneurial ecosystems.

BIOGRAPHY

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