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Promoting Entrepreneurship through a Community Learning Model – Case Study: Green Businesses

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Abstract
This article presents a community learning model formulated by Engineers Without Borders Colombia with the aim of providing communities with tools to create sustainable productive solutions which have relevancy for members and for potential customers. The goal of this formulation is to promote learning processes that are guided by decisions made by community members to propose sustainable and replicable initiatives. The model applicability is evidenced through a case study devoted to strengthening community-led green businesses in the Guavio Province, Colombia by collecting lessons and conclusions. Ultimately, this collection will prove useful in replicating the learning model in other similar rural communities.

Keywords Green businesses · Organizational learning · Green entrepreneurship · Guavio region Colombia · Engineers without Borders Colombia

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Introduction

As unsustainable consumption and production patterns have resulted in economic and social costs and sustainable development is challenged in all three dimensions: economic, social and environmental, sustainable development must respond to the needs of the most vulnerable, requiring actions focused on growth, employment and environmental protection, to promote economic and social progress (United Nations 2013). In this sense, cities and their inhabitants would be expected to be closely related to the processes, places and agents that sustain aspects such as the future availability of food, which is an indispensable necessity for survival. However, the link between cities and their food suppliers has deteriorated in recent years, as food reaches cities and homes as a processed product (Baquero et al. 2010).

Therefore, it is necessary to think about alternative businesses where traditional articles are not just produced but the environment is taken into account in a context where the percentage of the urban population has grown exponentially, to the point that it reached 54% in 2016, and by 2050, the UN projects that it will be 66% of the world population (United Nations 2014). Particularly, Colombia owns 94% of the rural territory and is apt to develop this type of alternative undertakings but currently there is a lack of stimulation of rural work, because the producer receives about 35% of the final value of fresh food or 15% of the price when it is processed, which usually does not cover production costs. (Baquero et al. 2010). Accordingly, it is necessary to develop models that allow to promote alternatives of entrepreneurship.

On the other hand, as it was mentioned before, sustainable development must respond to the needs of the most vulnerable, but the inappropriate stakeholder analysis and management often lead to conflict, controversies and eventually project failures (Ha et al. 2016); frequently the opinion and efforts of the people for whom projects are directed are forgotten, resulting in externally- driven development and projects imposed on communities (Network of Community Exchange Systems in Asia, Africa, and Latin America 2002).

As development projects involve multiple stakeholders from different cultures serving their own objectives and interest many studies in the field of project management have emphasized the value of stakeholder participation in achieving successful outcomes. Nevertheless, even various studies have been undertaken on stakeholder analysis and engagement there is still a lack of research on stakeholder relationships and knowledge creation amongst project teams and stakeholders. Traditional project management approach has been considered as problematic and incomplete, as it uses prior known knowledge for achieving predetermined goals and requirements while little additional learning occurs (Ha et al. 2016; Uribe 2018). However, practitioners and academics need knowledge to act on, instead of a merely contribution to aggregation of academic discourse (Hansson 2006).

Consequently, Engineers without Borders Colombia (ISF-COL), an alliance between University of los Andes (UNIANDES) and Minuto de Dios University Corporation (UNIMINUTO), developed a participatory community learning model concerned about how to promote sustainable internally-driven entrepreneurial systems by formulating productive solutions which must reflect local and rural contexts; sustainability problems are regularly contextual and complex, becoming critical to operationalize participatory processes in formulating future visions, objectives and action plans (Hara et al. 2016). This promotes empowerment, defined by the World Bank as "the expansion of assets and capabilities of people to participate in, negotiate with, influence, control, and hold accountable institutions that affect their lives" (Narayan 2002). On the other hand, knowledge that supports this model is

expected to be generated through learning processes and applied research, which allows to analyze reality in a rigorous, organized, and systematic manner (Vargas 2009). Then, we considered Participatory Action Research (PAR) for transferring researcher capacities and empowering people to assume actions to improve their life conditions (Park 1993).

This paper describes the methodological development of the model applied by ISF-COL in the execution of a community project, taken here as case study, articulating members of government entities, academia and rural communities in the context of the Guavio Region.

Context

The Guavio Province province is located close to Colombia's capital, Bogota. This region provides roughly 72% of the water to supply the demand of Bogota and 9.88% total hydroelectric production. Nevertheless, despite life quality of population settled in Bogota and its surrounding areas depends on Guavio's environmental sustainability, 27.2% of inhabitants has unfulfilled basic needs and main economic activities have traditional commercial schemes based on agriculture and livestock, where producers received low payments from intermediaries and ecosystems biodiversity and sustainability are threatened (Cámara de Comercio de Bogotá 2006). Subsequently, small-scale farming is ubiquitous and smallholder farmers must tackle multiple obstacles such as a lack of access to productive resources, lack of market information, poor human and physical capitals, low competitiveness of produce and poor bargaining power (Ha et al. 2016), among others.

Thus, work opportunities for young people lack long-term projection and knowledge exploitation, resulting in a labor force displacement from smaller to larger towns and a lack of entrepreneurial culture; at a national level, there are low entrepreneurial rates: 55% of ventures survive their first year and only 23% make it until the fourth (Pardo and Alfonso 2015). The percentage of new entrepreneurs has fluctuated between 7% and 16%, with a declining trend, and intentional and nascent entrepreneurs 'drain has increased almost 40% (Varela et al. 2015).

Theoretical Framework

This section will briefly review four subjects that we considered relevant in the construction of a community learning model focused on formulating sustainable productive solutions. First, the context of the general research gap discussed by the paper is described. Then, as a learning model is developed, it is important to review organizational learning, which is the capacity to create, organize, and process information from its sources to generate new knowledge at different organizational levels, creating a culture that favors learning and conditions to develop new capacities, to design products and services, to increase existing offer, and to improve processes focused on durability (Garzón and Fisher 2008). On the other hand, the model is focused on community participation, for which PAR was adopted, as it is a subset of Action Research (AR) which constitutes a form of praxis to solve pertinent problems through the engagement between researchers and practitioners in the field (Estensoro 2015), depends on creating collaborative relationships and requires a meaningful communication in order to stimulate a peaceful participant coexistence (Singh 2010).

Likewise, productive solutions' formulation is supported on Design thinking, which according to Li (2002), is a creative and proactive design vision with potential for transforming social reality by providing action framework to bring into existence functional services, or products. Finally, the objective of this model is to promote social development, therefore productive solutions' formulation is also supported on the notion of green business, which is socially and environmentally helpful, care for customers and clients, improve communities and lead to sustainable growth (Ali et al. 2017).

Stakeholder and Knowledge Management in Projects

As Ha et al. (2016) mentions in its literature review, the role of stakeholder and knowledge manager has been identified by literature as a critical factor in project success. For example, these studies show that development projects could be described as a "complex web of stakeholders." Several studies have demonstrated the importance of using appropriate tools for identifying these stakeholders and managing a key variable, i.e., the engagement level. However, there is still a lack of research considering how these stakeholders relate, and primarily, how they do interact to create and manage knowledge. The work of Ha et al. (2016) advances in this issue from the traditional perspective in knowledge management (Nonaka and Takeuchi 1995). However, there are still some other questions for review considering the process of what is called organizational learning.

Organizational Learning

According to Prange (1999), the concept of organizational learning was mentioned for the first time in the early 1950s and then researchers became attracted by it in the early 1960s. But it was only in the late 1970s that more frequent publications, such as those of March and Olsen (1975), Argyris and Schön (1978) and Duncan and Weiss (1979), began to flow. Later, during the 1980s and 1990s some 50 and 184 articles were published in academic journals respectively, and research continued.

Just to mention relevant research, we can highlight March and Olsen's (1975) understanding of organizational learning as resulting from shared mental models' transformation (SMM), Argyris and Schön's (1978) concepts of the single-loop learning and the doubleloop, the single cycle of observation, assessing, designing and implementation (OADI) described by Kofman (1992) and the Kim's (1993) consideration of learning as skill acquisition and conceptual understanding of experiences. This last author combined previous research into the formulation of the OADI-SMM organizational learning integrated model.

Considering the OADI-SMM model, Espejo et al. (1996) state that the essence of learning is the ability to adapt to change, a fundamental prerequisite for the survival of an organization. Similarly, they explained that strategic management must be focused on figure it out how to learn, acquire, maintain and enhance relevant organizational properties such as responsiveness, capacity for innovation, adaptability, flexibility and communication competence. On the other hand, learning may require facilitating factors, such as the five proposed by Alegre et al. (2007): Experimentation, risk taking, interaction with the external environment, dialogue and participatory decision making.

Participatory Action Research (PAR)

Kemmis and McTaggart (2007), trace the origins of action research to the psychologist Kurt Lewin, who published about action research related to community action programs in the United States during the 1940; he wasn't the first who applied actionist approaches, but his work gave impetus to the action research in many disciplines. Although Lewin emphasized the importance of collaboration, he didn't strongly emphasize in the PAR's participatory nature, in which participants work collaboratively in the co-generation of new knowledge to address specific issues (Jacobs 2016).

Participatory research has its roots in liberation theology, approaches to community development and human rights activism, distinguish from conventional research by attributes, such as shared ownership of research projects, community-based analysis of social problems, and an orientation toward community action (Kemmis and McTaggart 2007). In the 1960s and 1970, as result of political and social consciousness, researchers felt that research leading to social action would be more meaningful if a participatory relationship with the organization or community involved is established. Then action research became participatory action research. However, the end results of both action research and participatory action research are the same, social change (Fontaine 2006).

Design Thinking

Design historically was associated with the artisan and the muse as source of inspiration. Nevertheless, opposed to this developer-centered approach, the user-centered approach emerged from the influence of the 1970s and 1980s software industry on design and became the dominant model in the 1990s and 2000s, making the person who will ultimately use the product or service the primary focus for the objectives of the design exercise (Burns et al. 2006). According to de Guerre et al. (2013), building design now include fields such as interaction, service and experience and Design Thinking is the integrated approach at the core of the design process, with three pivotal attributes:

- Conceptual clarity about a system's needs, market opportunities, and what makes good strategic business sense through observational research and experience.
- Prototype iterations that leverage new inputs and feedback.
- Execution of the prototype currently most effective without attachment, knowing that one day it will inevitably have to change.

Green Business

While the origins of the green movements can be trace down to the 1960s, it took almost 20 years for business to adopt greening trends into its practice, coining the term "green business" (Čekanavičius et al. 2014). The term has been defined in many ways, departing from the Smith (2003) and Friend (2009) definition, as "*businesses and practices that are viewed as environmentally sound, including the use of organic and natural products to build factories, tighter protection against emissions and environmentally friendly sourcing of materials*" (Smith and Perks 2010, p.4.), until the definition considered here, as the "*organization committed to the principles of environmental sustainability in its operations*

striving to use renewable resources and trying to minimize the negative environmental impact of its activities" (Čekanavičius et al. 2014, p.87).

In recent decades, China, India, Brazil, Russia, and some other growing developing countries have become major contributors to green business phenomenon (Ali et al. 2017). However, the green business concept is rather ambiguous and its practices are still far from being universally embraced, due to several reasons, such as cultural, political, and economic differences and the perception of the "greening of business" as an extra burden, in terms of cost increase or revenue loss (Čekanavičius et al. 2014). On the other hand, recently consumers have become aware of the impact of businesses on the environment and sustainable practices can strengthen reputation, improve employee morale, lead to cost savings and benefit the environment (Smith and Perks 2010).

Research Methodology

Based on the needs acknowledged by the Guavio territory, ISF-COL set as its objective to formulate a learning model focused on communities' empowerment in a meaningful and replicable manner for this and similar contexts. As the effort of an alliance between two universities, the model was expected to be applicable in projects that not only involve community members but also students, resulting in plurality of actors.

According to these objectives, ISF-COL formulated the ECL-POCDI model (Entrepreneurial Community Learning- Preparation and Observation, Conception, Design and Implementation), supported on the PAR methodology; a qualitative research methodology that allows to reveal features of an individual's sighs, feelings and patterns without manipulation or control from the researcher. As a qualitative methodology, rather than predicting or controlling, PAR purpose is to describe and understand, to interpret and document an entire phenomenon (MacDonald 2012). On the other hand, PAR is the "systematic collection and analysis of data for the purpose of taking action and making change" (Gillis and Jackson 2002, p.264), as a result, PAR constitutes an approach to social investigation and to act.

Various methods for data collection are used in PAR and their utilization is collaborative, determined by participants and researchers according to the specific situations. Between these methods, the three most commonly cited methods in the literature are participant observation, interviews and focus groups (MacDonald 2012).

- Participant observation allows researcher to obtain first-hand knowledge of social behavior (Gillis and Jackson 2002). This method involves systematic observation and the recording of events, behaviors and objects using thorough field notes (Marshall and Rossman 2006).
- Interviews are face-to-face verbal interactions appropriate for collecting data, regarding human experiences by enabling participants to describe their ideas, thoughts and memories in their own words. In this case, researcher usually obtain information from direct questioning (MacDonald 2012).
- Focus Groups are classified in a type of in-depth interview focused on the interaction inside a group that allows to collect an appropriate amount of data in a short period of time (Freitas et al. 1998).

ECL-POCDI Model

This article proposes the ECL-POCDI Model (Fig. 1.), an entrepreneurial community learning model structured in three phases (Preparation and Observation, Conception, Design and Implementation). Along these phases, community members are expected to constitute a portfolio of initiatives offering products and services with positive impact on environmental, economic and social aspects, responding to their own requirements and functional for consumers in a potential market, for which PAR and Design Thinking approaches, with a holistic technological thinking, are applied.

First, considering that PAR emerges from AR and "AR's distinctive characteristic is that "*it addresses the twin tasks of bringing about change in organizations and in generating robust, actionable knowledge*" (Coghlan and Shani 2014, p.525). The knowledge resulting from the application of this learning model is expected to be focused on the successful introduction of productive solutions into a market. Then Design Thinking is well-thought-out as it combines designer's sensibility with methods to integrate people's needs with what can be converted into market opportunities and customer value through a viable business strategy, pursuing balance between science and art, analytics and intuition, validity and reliability, exploitation and exploration. (de Guerre et al. 2013). These solutions must not be just functional, Design Thinking seeks to create products and services significant for users, incorporating their needs to prototyping. Therefore, a non-artefactual but holistic vision is taken into consideration, understanding not only whether technological solutions are viable but also how their functionality is perceived, whether people know how solutions work and are able to appropriate them.

Considering this approach, possible solutions to identified problematics result from brainstorming processes and solutions are transformed into products or services by developing prototypes in experimentation processes (Brown and Wyatt 2010). According to Styhre and Sundgren (2005), experimentation in AR has a broader sense, as action researcher cannot entirely control and determine the environment and the process of the experiment, opposed to the laboratory scientist. "*The concept of experiment does here therefore denote the practices of producing new insights and knowledge on basis of new organizational arrangements and activities. The experiment is in brief a practice of changing the organization's routines or to make use of newforms of organizing within existing routines. The experiment is never conclusive but is always serving as the basis for further experimentations*"(Styhre and Sundgren 2005, p. 58).

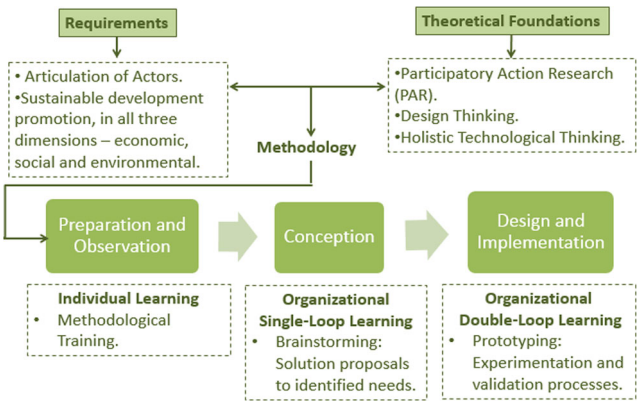

Fig. 1 ECL-POCDI Model

Preparation and Observation

This phase is focused on supporting stakeholder management, which is fundamental in achieving successful outcomes, as it seeks to avoid conflict and controversies during project execution. From this process, identifying relevant stakeholders, their potential influence on a project, interests and expectations is a key element of stakeholder engagement and analysis, helping to address critical success factors for a project, such as generating an environment for collaboration and trust, building interrelationships and developing mutual understandings (Ha et al. 2016).

On one hand, collecting data through observation and interviewing is useful to identify participant relevance, potential, interests and expectations. On the other, establishing spaces for participant interaction may help to develop interrelationships and to bolster trust and collaboration. Moreover, conducting workshops for methodological training may be convenient for developing mutual understandings.

Conception

In the second phase, brainstorming participatory spaces are developed for the first collective actions, from which learning is an expected result. Individuals are expected to participate in the collective construction and selection of ideas, while results are documented to conduct knowledge management processes. Since this stage is meant not only to share knowledge and improving skills but also to formulate solutions to previously identified needs, learning comprises the Argyris and Schön (1978) single-cycle, were individuals, under their mental models, detect inconsistencies in terms of expectations and respond to them by modifying strategies and assumptions in constant organizational bylaws.

Design and Implementation

In the final stage, actions focused on prototyping for initiatives implementation take place in participatory design spaces, following the process (Fig. 2.) designed by Engineers Without Borders researcher Diana Duarte. This is a transformative design process, influenced by individual's values, beliefs, experience and knowledge (Li 2002). Here, prototyping is an experimentation process which requires feedback to validate bylaws and assumptions which is consistent with the Argyris and Schön (1996) double-cycle learning: an episode with a

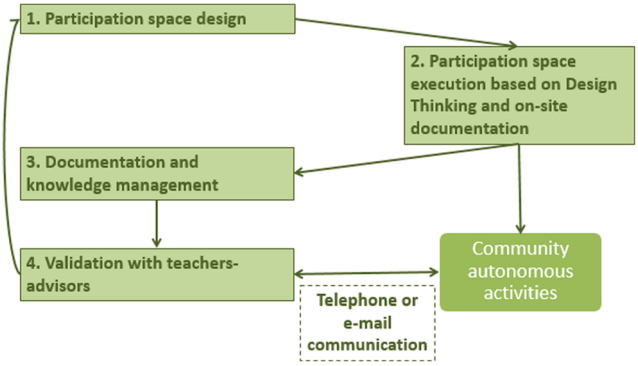

Fig. 2 Participatory Design Process

feedback double cycle connecting mistake detection of effective performance strategies and assumptions with the guidelines that define such performance.

Case Study: Guavio Region Community Green Business Strengthening Project

The project "Fortalecimiento de las Capacidades de Innovación Social en Bogotá-Cundinamarca", which means Strengthening of Social Innovation Capacities in Bogotá-Cundinamarca, was raised through the agreement No. SCTeI 019 of 2013 in charge of the Scientific Park of UNIMINUTO and Cundinamarca Governor's Office and it was financed by the Science, Technology and Innovation Fund of the Colombian General System of Royalties.

Part of this project was devoted to consolidating a network of at least 35 productive units (companies or entrepreneurships), located in Gachetá, Junín, and Guasca municipalities, strengthening their green profile through a community learning process. Additionally, it sought for the participation of 350 high school students from those three municipalities with the purpose of inspiring entrepreneurial interest among the youth. Likewise, it urged college students from UNIANDES and UNIMINUTO to participate, reinforcing their academic formation.

In accordance with the model formulation, this process of community learning is described below.

Preparation and Observation

ISF-COL spent two years interacting with the community, seeking to consolidate relationships and develop rigorous observation and interviewing processes to identify potential participants, according to their commitment. Subsequently, to generate conditions for future participatory spaces and considering participant features, developing an integration process with entrepreneurs was proposed. This process also involved methodological preparation workshops with students and an event with entrepreneurs and students interacting for the first time.

First, with the aim of communicating project objectives and network importance for regional economic dynamics, entrepreneur integration events were performed, involving two types of motivation for assistants:

- Communication of expected benefits.
- Food was supplied by project participants.

In parallel with the entrepreneur integration process, 12 Innovation-Actions Workshops were executed with 370 students from four schools: El Carmen Departmental Educational Institution and Mariano Ospina Rodríguez Technical – Commercial Departmental Educational Institution at Guasca municipality, Gachetá Normal High School, and Junín Normal High School. These training sessions provided students practical skills to become part of a social innovation process and to recognize their context as a potential ecosystem for green entrepreneurship.

To conclude the preparation phase of the project, the sustainable entrepreneurship seminar: "Quinoa Farming and Other Green Businesses" was held, congregating all participants. During the seminar eight speakers, both with academic and professional backgrounds, illustrated the thematic of the event around sustainable entrepreneurships and successful quinoa plantation and commercialization cases.

Conception

In a brainstorming event, named Green Solution Laboratory, *30 teams* were constituted, each one with productive unit representatives and high-school and college students. Divided in *three areas*, depending on the main activity of the productive unit, each team proposed a green business solution idea. *Each area selected three ideas and a panel with eight judges selected another one* (Fig. 3.). The criterion for formulating and selecting the ideas was their potential to provide technological solutions and bolster productive units in a social, economic and environmentally responsible way.

Design and Implementation

Seven interdisciplinary teams experimented to transform the ideas into productive initiatives, through participatory spaces focused on encouraging the community to perform self-led activities. Therefore, Participatory Design Workshops were configured to generate business plans, conceptual models and functional prototypes, considering theoretical and practical limitations. Also, during these spaces a website was designed for knowledge management in real time.

The ideas were transformed into four initiatives, associated to seven final degree projects, focused on developing strategic business plans.

Touristic Plan: A Healthy Journey A journey around four farms was designed, focused on the environment and healthy regional cuisine. This initiative was focused on the construction of a tourist circuit, as well as the consolidation of the farms as tourist-oriented and self-sustaining. As participatory design spaces, experimental tours were developed, to feedback entrepreneurs on logistical and price issues.

This initiative has evolved consistently with the regional commitment to consolidate a touristic water circuit, using the learning generated from the project to strengthen the consolidation of the participants with productive units as touristic operators. Currently operators are working to offer tourists the possibility of getting involved in farming activities, such as planting and tending sheep, and tasting quinoa-based foods.

In the municipality of Gachetá several farms have improved their conditions to meet the demand of agritourism and the evolution of Truchera OASIS, which has a gastronomic offer

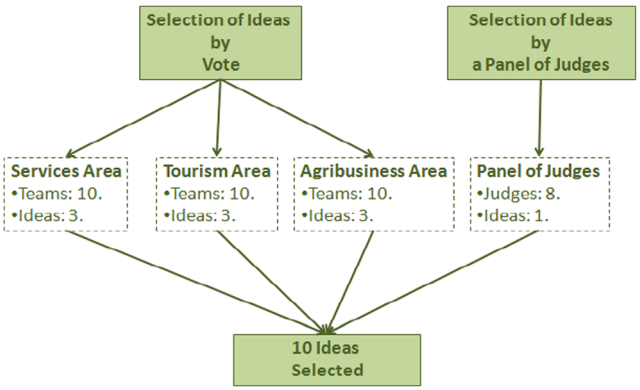

Fig. 3 Green Solution Laboratory Ideas Selection

and is in the process of being accredited as a green business by the Regional Autonomous Corporation, CORPOGUAVIO, is outstanding.

Quinoa: Everyone's for Everyone ASOPROQUINUA, focused on boosting quinoa production, recollection and future commercialization, was constituted through four participatory design spaces: a space for interaction with the members of the association, a field school, a quinoa commercialization workshop and a space for the design of a prototype focused on the inclusion of quinoa in people's diets.

The association currently consists of 9 associates, mostly women. All are family farmers, with growing areas less than 10 thousand square meters. They produce using traditional methods and have a participation of the family nucleus in the productive activities, sowing vegetables, aromatic, fruits, and cereals, among others.

The association's product portfolio has grown with an offer of quinoa in seed, ground, flour, fermented beverages and bread. Similarly, in Guasca, under the agreement between the Siemens Foundation and UNIMINUTO, the association has developed activities to generate learning about new techniques of the cultivation of Quinoa and participated in a call for international cooperation funds for the strengthening of sustainable food chains, in support of the Social Innovation Scientific Park of UNIMINUTO. However, greater efforts are needed to strengthen ASOPROQUINUA as an organization.

Honey Byproducts A team integrated by an entrepreneur and students formulated a business model for a soap in bar and liquid presentations, developed with an expert help in the participatory design spaces with the aim of initiating a portfolio of honey byproducts.

The entrepreneur who participated in the prototyping, working in his apiarian enterprise, has generated honey byproducts such as essence of propolis, unprocessed natural honey, among others. However, for the mass production of the soaps designed, additional investment and the realization of alliances with other beekeepers are required.

Research Programs for the Network from the Schools Two solution ideas proposed by teams without a productive unit representative at the Green Solution Laboratory, were developed as research programs from schools, focused on region visibility. With respect to the first solution, there was a material collection for a magazine and a photography gallery; whereas for the second solution, a smartphone application to access the network website was designed. Workshops at schools served as participatory design spaces for these solutions.

This initiative did not generate the expected transcendence, since at the end of the school year the students did not continue the process. This evidenced that to guarantee the sustainability of this type of initiatives the commitment of the teachers must be encouraged, these shall endeavor to ensure continuity of the initiatives, year by year with the new students.

Discussion on Findings

In order to review the research findings, these will be discussed from two perspectives; one, from the different stakeholder points of view, and second, from the theoretical perspective:

Stakeholders Perspective

i) Related to all participants

Relationships amongst participants were formed and enhanced, enabling them to expose and understand each other's mental models, and to discuss common issues and possible ways to solve them. From this, it was expected that projects would arise in the laboratory, responding to common problems and awaken in the participants the interest to participate. However, there were cases in which the participants recognized the value and voted to carry out some initiatives in which they did not necessarily intend to participate.

ii) Related to community members

Community members were able to experiment in prototyping spaces to improve their capabilities, expecting that solutions would be viable in the long term. On Friday, August 11, 2017, more than three years after project ending, allowing community members to evaluate their generated capabilities, a 'focus group' was stablished with more than 10 participants, belonging to Guasca municipality. From this exercise, three main points were identified. The italicized testimonials are literal transcripts of Focus Group audio records.

- It is clear to the participants that learning about the use of tools for entrepreneurship and innovation is not just a contribution to knowledge but also supports action. Referring to business plans, an entrepreneur said: "*I use DOFA, you used CANVAS. This was invaluable because it was very agile and at least I like that when working with this model things are fast, no longer speak and speak, but going more to action*".
- The participants appropriated the concept of "green business". At first, among other terms, this subject was unknown to them, as manifested by a participant statement, "*Green Business for me was brand new. Costs, if we had studied something commercial, would not be anything new, but we did not see any of that before*.", but currently it is highly appreciated by the community. After three years, the beneficiaries still clearly describe the concept, and its exceptional character. As the entrepreneur who said "*All this started with green business, we were trained in green business entrepreneurship, and the training lasted around 3 or 4 months, and each of us could carry the business idea we had and start doing the analysis of how we wanted to transform it into a green business, sustainable, ecological, having healthy practices, not mistreating people, valuing people, respect*".
- The local entrepreneurs appropriated their own reality, breaking with the tradition of welfare projects which generate dependency. In the words of an entrepreneur: "*I learned that we must look at our challenges and how to fight, not just stay there but self-overcome*".

iii) Related to students

Students were introduced into a real context, strengthening their academic learning processes through experiences, knowledge and problematics shared by community members. However, both college and university students had an expected participation in the project of an academic period and did not generate a commitment of them to the project in the long term. An alternative to give continuity to the work of students in future projects may be to find ways to generate greater commitment from teachers.

Project Management Perspective

As the literature has shown, the way stakeholders in a project interact and create and use knowledge, can be a critical factor in its success. However, as the results from the case have shown, it is not enough with identifying the stakeholders, managing the engagement level and their relations. It is necessary to manage the organizational learning process taking place in a project in a practical way.

The proposed ECL-POCDI Model can help development project practitioners to effectively integrate Design Thinking and the PAR approach into their work, allowing the generation of really innovative and participative solutions to the community's problems. The three phases model allows this. The Observation and Preparation phase, allows the project team to make a complete understanding of the project context, including identifying stakeholders and their relationships. The Conception phase allows a co-creation of the solutions between all the stakeholders, and generating high levels of engagement; even more, allows to use, through the Design Thinking Tool, all the creative power of the project participants. All these characteristics allow a better process of solution implementation in the model's last phase.

Conclusions

This learning model development contributes to support project management on systemic plans and actions, resulting from ongoing analysis and participant engagement, instead of a traditional "plan then execute" approach where little learning occurs (Coghlan and Shani 2014). This learning process design and application help to fill the current research gap on participant relationships and knowledge creation amongst projects, by presenting practical evidence of how PAR and Design Thinking approaches provide actionable knowledge which strengthens participants' capacity to handle problems that are of their common interest.

As well, this model is a contribution to the literature about sustainable development, as researchers can find in the case study elements, such as approaches, strategies and practices, that can help organizations to build effective initiatives seeking to boost growth of green business. Previous research on sustainability has been focused on utilizing the power of scientific knowledge to address problems belonging mainly to the environment dimension of sustainability, such as climate change, protecting marine fisheries and ensuring adequate water resources (Miller et al. 2013). In contrast, this proposal involves all environmental, economic and social dimensions.

On the other hand, initiatives like those of the case study offer a learning opportunity that extends beyond community members. Firstly, as described here, these initiatives may be valuable opportunities to introduce students to real context involvement, strengthening their academic learning processes through experiences, knowledge and problematics shared by community members. As well, students can reciprocate knowledge and perspectives that reinforce solution construction processes. Additionally, when communicating in a transparent way about the failures and successes of experimentation within the project, others can observe, learn and replicate.

Also, among the model application in the case study, elements of AR which are also present in social innovation processes were identified, such as knowledge cogeneration and socialisation, shared problem-setting, mutual empowerment, and the development of specific capabilities that facilitate self-managed transformation processes, opening lines of research

related to the application of learning models like this in other innovation processes within several social context (Estensoro 2015).

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