EDS Integrated Approach for Sustainability (EDS-IA): Campus as a Living Laboratory Experience

Liliana Diaz and André Potvin

Abstract Since 2016, Institut EDS is developing a new integrated approach to facilitate collaborations between different disciplines and to reinforce the development of practical skills and key competencies needed to solve concrete sustainable development problems: the EDS-IA. It aims to contribute to the acceleration of the transition to a closed and cyclic development system, building on the most recent knowledge mobilization frameworks in the field: the concept of Planetary Boundaries, the concept of Social Floor, the Sustainable Development Goals, Key Competencies in Sustainability and Multilevel Governance. Despite the broad consensus and the robustness of the scientific knowledge underlying all these frameworks, they are not sufficiently known beyond their own field of knowledge. In order to facilitate their diffusion and their appropriation by all the disciplines and actors concerned with the transition to sustainability, EDS-IA integrates them in a diagram as a tool that can be adapted to different development challenges in different contexts. During its first year of implementation (2016–2017), researchers and student members of the Institute participated in a series of major co-creation activities along with staff university members, governmental organizations as well as representatives of civil society. They made a diagnosis of the sustainable status of the campus and imagined innovating solutions for a "Campus as a living laboratory" through operations, teaching, research, and community services. In the second year (2017–2018), the transfer of the EDS-IA started through similar workshops with a university partner in Senegal (UADB). This paper presents the theoretical and methodological frameworks of the EDS-IA and the results of the first two years during which universities have been imagined as living laboratories for SDG promotion and implementation.

Keywords Sustainable development · Participatory methods · Partnerships between academics and society

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1 Introduction: The Challenge of Mobilizing Disciplines Towards Sustainable Action

L'Institut Hydro-Québec en environnement, développement et société (Institut EDS)[1] has the mission to "promote a 360-degree vision of environmental and sustainable development issues by spearheading and conducting activities aimed at furthering, acquiring, and disseminating knowledge in order to mobilize stakeholders and generate tangible results for society". This mission builds on its role in supporting and developing interdisciplinary research at *Université Laval* as well as on innovations in education and knowledge sharing. Since its creation in 2004, with a generous support of Hydro-Québec, *Institut EDS* helps pool and drive efforts to better coordinate knowledge-sharing activities of its some 100 researchers, 400 student members, and research chairs and groups from most of the eighteen faculties of the *Université Laval*. Five interdisciplinary axes serve to weave collaborations: *climate change*, *biodiversity* and *water* representing three main global environmental challenges; *cities and territories* as a priority action level; and *governance* as a key for transition to sustainability. These axes correspond to the three interrelated components defining the "pillars" of sustainable development: environment, development and society.

When André Potvin became director of the Institute in 2016, he set up an approach that aims to facilitate collaborations between researchers and stakeholders, and he called it "EDS Integrated Approach" (EDS-IA). This approach is based on an understanding that environment, development and society—the three parts of the institute's name—are all variables in an equation defining a close cyclical system based on environmental limits. Thanks to the contributions of the many scientific disciplines, it is possible to understand and recognize the limits that natural cycles and resources flows should impose on human actions. It is also through the interdisciplinary work that we can imagine new and more respectful responses to human needs, according to environmental limits. In a teaching context, still very fragmented by faculty divisions, EDS-IA is used as a tool for designing educational activities for students from all the study programs[2] to contribute to develop Key Competencies in Sustainability (Wiek et al. 2011). Furthermore, by considering the different scales of intervention of each pillar, EDS-IA aims to help understand the challenge of multilevel governance, which can only be tackled through a concrete practice of interdisciplinarity (Hufty 2011). Ultimately, by mobilizing and strengthening the links between academics and a multiplicity of stakeholders, EDS-IA encourages the transformation of universities into living laboratories for the promotion and implementation of the Sustainable Development Goals (SDG).

[1] www.ihqeds.ulaval.ca.

[2] There are almost 240 graduate programs at *Université Laval.*

2 EDS-IA Conceptual Framework: From a Linear to a Cyclical and Multilevel Model

Traditional development models have mainly been linear and open, responding only to short-term human needs and leading to a culture that degrades the environment. To express a vision of society that breaks with this model, we propose a representation of a cyclical process which focuses on the interactions between the three pillars of sustainability. This process is triggered by the multiple needs existing in society. The answer to these needs becomes tangible through artefacts of all kinds (goods, infrastructures, buildings) and results in the development of cities and territories. In turn, this development produces environmental impacts such as climate change, loss of biodiversity and alteration of the water cycle and aquatic environments (Fig. 1).

This cyclical vision forces us to rethink the needs of society according to the limits imposed by the environment. It also requires the introduction of new technologies and practices for reducing environmental impacts. This double exercise is at the heart of the EDS-IA since it aims to facilitate the emergence of new solutions to meet the essential needs of humanity, while integrating the respect of bio-geochemical cycles of our planet.

Moreover, in order to improve consistency and effectiveness of any intervention we need to take into account not only the interactions between these three pillars, but also with an between different scales of intervention at each pillar. Thus, in the social pillar, we must consider both individual and collective needs as well as institutions that regulate potential conflicts between needs and encourage behavioral changes. In the "development" pole, we need to consider all artefacts, goods and services produced to meet the needs of society. It goes from consumer goods, to the planning of territories, through that of cities. Regarding the environment, we must consider the links between ecosystems and the impacts of human actions on natural cycles, from

Fig. 1 Towards a cyclical vision of development

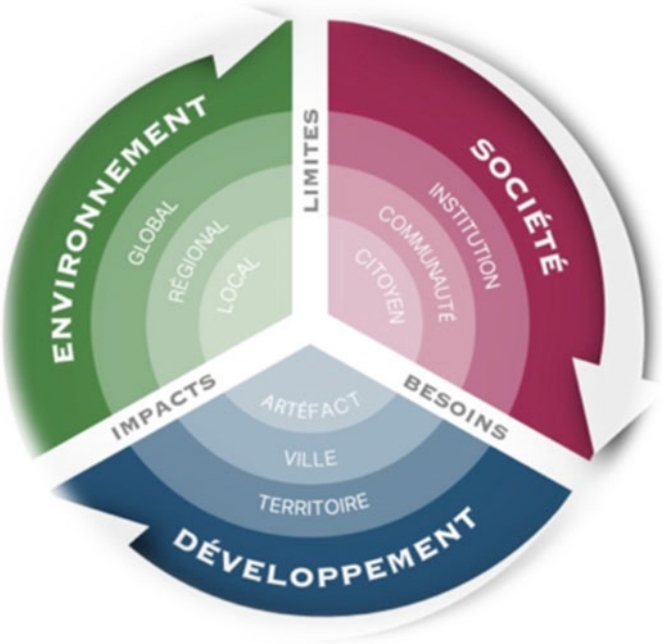

Fig. 2 The "ideation engine"

local to global. In order to tackle all these aspects, it is necessary to mobilize many disciplines around a given object of analysis. It is through this "interdisciplinarity in practice" (Hufty 2011) that this approach contributes to a better understanding of multiple issues related to sustainable development and encourages the emergence of new solutions. This is what we call the "Ideation Engine" (Fig. 2).

2.1 Systems Interactions

The EDS-IA is based on the assumption that a common understanding of the meaning of sustainable development is a prerequisite to improve the effectiveness of any collective effort. It is well known that, according to the definition of the WCED report, sustainable development contains within it two key concepts:

- the concept of 'needs', in particular the essential needs of the world's poor, and
- the idea of limitations (WCED 1987).

EDS-IA come back on these concepts from the most recent frameworks for research and action in the field of sustainable development and integrates them in a conceptual diagram. Those frameworks are:

- Planetary Boundaries (Rockström et al. 2009a, b; Steffen et al. 2015)
- Social Floor (Raworth et al. 2012)
- Sustainable Development Goals (United Nations General Assembly 2015).

2.2 Planetary Boundaries

According to Joan Rockström's team, there are nine functional boundaries or thresholds beyond which biogeochemical flows can be irreversibly altered (Rockström et al. 2009a). We can grouped it into three trios, depending on the sphere in which they have the main influence: the atmosphere, the hydrosphere and the biosphere. These three spheres interact with each other and with the lithosphere. In the same way, boundaries' action also transcends a single sphere. Three functional limits primarily concern the atmosphere: atmospheric aerosol loading, stratospheric ozone depletion and climate change. Three others affect mainly the hydrosphere: chemical pollution, interference with the global phosphorus and nitrogen cycles, and global freshwater withdrawn. Finally, three others affect the future of the biosphere: ocean acidification, land-system change (owing to agricultural and urban land expansion) and biodiversity loss. We now know that boundaries concerning the rate of biodiversity loss, climate change and the nitrogen cycle have already been exceeded (Rockström et al. 2009b).

These functional boundaries are values established from the best of current scientific knowledge in order to maintain the impacts of human actions at a reasonable distance from the thresholds and thus preserve the self-regulating capabilities of the Earth. They are markers rather than definitive values, and the incessant scientific refinements make them more and more accurate. Identification and monitoring of planetary boundaries are based on data compiled for over forty years by consortia of global research on environmental change. The awareness of the existence of functional limits is part of the sustainable development path, since these limits inform us about the margins that our civilization still has or not. This information is being used as a tool to support decision-making processes and it is now one of the mandatory references of all United Nations agencies (Anctil and Diaz 2016, p. 64). The first two of the exceeded thresholds are the subject of multilateral agreements since the 90s.

The Nature's conception imbedded in the planetary boundaries approach is typical of our era. This representation is no longer part of the opposition between "ecocentrism" and "anthropocentrism", but reflects the ethical consequences of the Anthropocene for humanity: the obligation to find solutions to global problems generated by its intervention (Steffen et al. 2011). Instead of an Earth system considered as a mere provider of the socio-economic system, as it's represented in the so-called "anthropocentric" models, or as an envelope and support of life, as conceived by "ecocentric" models, planetary boundaries represent the most vulnerable side of our planet, both threatened and dependent on human actions. Humanity now realizes that "it depends on us that everything does not depend solely on us" (Serres 2014).

2.3 Social Floor

Adding a "social floor" to Rockstrom's "environmental ceiling", Kate Raworth, relied on the planetary boundaries approach to build her "donut" theory (Raworth 2012). She then delimited more precisely the safe and just space for humanity prosperity, representing the inalienable social gains to be guaranteed for equitable development.

As reminded before, human needs are one of the two central elements of the concept of sustainable development. Indeed, the WCED definition of sustainable development imposes the responsibility towards future generations as a condition to meet the needs of the present. This position echoes a consensus already present in the Stockholm Declaration (1972) which stated that concern for future generations should be an objective of humanity. In order to clarify the purpose of this responsibility, the WCED report drew on notions of needs and limits, which were at the heart of the polemics between the South and the North in the 80s. Indeed, to reconcile the concerns of inequality, both within and between countries, the WCED retained the principle of "inner limits" to sustainable development, which means to ensure the satisfaction of basic needs of all. Therefore, when it comes to reconcile development and environment, criteria that should guide the choice are the meeting of the needs of the poorest without exceeding the limits of resources and ecosystems (Anctil and Diaz 2016, p. 35).

Raworths's approach thus completes and updates the notion of sustainable development by identifying eleven essential needs to be guaranteed for all. Inspired by existing declarations and conventions on human rights, and based on global socio-economic statistics, she affirms that basic needs are income, food, education, health, gender equality, water, energy, jobs, social equity, resilience and voice. These needs are, for the most part, covered by several of the Sustainable Development Goals.

2.4 Sustainable Development Goals

Both Rockström and Raworth's approaches influenced the debates of the United Nations conference on sustainable development, Rio + 20 in 2012. These discussions led to the adoption in 2015 of the 17 Sustainable Development Goals (SDGs) by the United Nations General Assembly as part of its 2030 Agenda for Sustainable Development.[3] Building on the lessons learned from the Millennium Development Goals, this new framework must apply, if it wants to have the desired impact, to all countries, to all scales of intervention and by all actors and stakeholders.

Despite the broad consensus and the robustness of the scientific knowledge leading to SDGs adoption, they are still not sufficiently known beyond the domain of multilateral agencies, development cooperation and environmental sciences, and even less in francophone circles.

[3] https://www.un.org/sustainabledevelopment/.

Fig. 3 Conceptual scheme of the EDS integrated approach

For this reason, we have found the relevance of using a simplified representation to communicate the complexity of this new common challenge. In order to facilitate the diffusion and appropriation of this three approaches, we conceived a conceptual diagram to present them in an integrated way: the conceptual scheme of EDS-IA (Fig. 3). At the center of the scheme, the "ideation engine" contains the notion of scale, essential in the operationalization of sustainable development. Around, a donut circumscribed internally by the "social floor" and externally by the "environmental ceiling", represents the 17 SDGs. This graphic is used in training and research activities to analyze existing initiatives and imagine new ones by mobilizing all the information contained in each portion of the wheel in an integrated way.

3 Methodological Approach: Participatory Action-Creation

The conceptual scheme graphically represents the complex links between all the systems concerned by the issues of sustainability in the new context of the Anthropocene. This common starting base facilitates exchanges and collaboration among stakeholders.

The EDS-IA brings stakeholders together around a common analysis object. This object of study becomes a pretext for dialogue around a tangible problem of development requiring the competencies of all disciplines and the contribution of all types of knowledge. An analysis conducted since 2012 at *Université Laval* has identified more than 365 courses in all campus programs, all cycles combined, that contribute to the development of Key Competencies for Sustainability (KCS) (Richard et al. 2017). According to Wiek (2015), the project-based or case-study approach ensures the best conditions for acquiring the KCS and achieving a true interdisciplinary work. Based on this solution oriented approach, EDS-IA was designed for EDS activities that serve as integrative extracurricular trainings targeting the entire university community and students from all programs.

The integrated EDS-IA was designed first to mobilize researchers, teachers and students. However, by its very nature which is anchored in a specific environment or object, it calls for the intervention of professionals, citizens, entrepreneurs, governmental organizations from all sectors and scales of action as well as representatives of civil society organizations. Is thus a tool to facilitate dialogue between stakeholders, from different disciplines and sectors, around a given development challenge. This multi-stakeholder aspect characterizes the "living laboratory" dimension of this approach (UMVELT 2014). This dimension is part of the continuous improvement process that *Université Laval* has been driving since 2010 in its sustainable development performance guided by STARS certification criteria, managed by the Association for the Advancement of Sustainability in Higher Education (AASHE). Inspired by the R&D community, AASHE encourages universities to use their infrastructure to create environments facilitating multidisciplinary learning and applied research to promote sustainable development on their campuses in what it calls "campus as living laboratories" (AASHE 2017). EDS-IA contributes to *Université Laval*'s goal of improving the campus experience while promoting its outreach and positive impact on the surrounding community.

Since 2016, EDS has identified an object of study each year around which it invites all stakeholders and communities to mobilize to find new solutions and improve existing ones. For each object of study, the EDS-IA forecasts the realization of three sequential and additive stages: diagnosis, mobilization and ideation. The results of each step feed next one. Activities of each step can be adapted according to the studied object and to the concerned stakeholders.

3.1 Diagnosis

This first step aims to facilitate the appropriation of sustainable development issues and encourages the commitment of stakeholders, by answering the question: *What does sustainable development mean in my living environment*?

Participants are invited to carry out a participatory diagnosis on the studied object. The exercise begins with an appropriation of the different elements of the conceptual scheme. Participants are asked to identify the complex interactions between the different SDGs and the state of disruption or respect of environmental and social boundaries. The findings shared by the group are represented on the diagram.

This exercise allows to realize that, although the targets of some SDGs are fully compatible and even offer a multiplier effect, others may be incompatible. Consequently, this tension force the identification of innovative solutions to solve problems related to governance, development or the environment. This step can lead to the prioritization of SDG in the studied object and to identification of some possible solutions that can be further developed and elaborated in the following steps.

3.2 Mobilization

This second step mobilizes the knowledge and the actors that can contribute to the identification of new initiatives and solutions. The question that guides this step is: *What new contributions can I (each participant) make to existing initiatives and to the proposals from other participants*?

Based on the conclusions of the diagnosis, the scientific knowledge relevant to the studied object is presented and discussed in the form of workshops and plenary sessions at a symposium, forum or similar outreach activity. The different perspectives and knowledge brought by researchers, students and local actors are thus confronted around the studied object in order to bring out new hypotheses of interdisciplinary research and collaboration with society.

Knowledge mobilization is at the heart of the process in every activity. It is by sharing their knowledge about the state of the analyzed object that participants can converge to sound diagnosis. They can also identify the need for new knowledge to formulate solutions. Mobilization challenges the ‘owners’ of the specialized knowledge or academia to better communicate, develop and expand it in collaboration with society. This step also implies the effort of establishing a strategy to identify, reach and engage all stakeholders as early as possible in the process.

3.3 Ideation

Based on the results of the diagnosis and the knowledge mobilization from all stakeholders, participants at this step propose new solutions to the problems identified for the studied object. This prospective step forces the contextualization and the appropriation of knowledge by all the actors in an intense creative activity of short duration. The proposed solutions illustrate the benefits of an integrated and interdisciplinary approach to development.

4 EDS-IA Results and Implementation

4.1 Year 1: 2016–2017—Université Laval, Québec, Canada

Université Laval in Québec city is one of Canada's top research universities and global leader in numerous cutting-edge disciplines. Recognized internationally for having reached the first place in Canada according to the STARS-gold level accreditation granted by the AASHE association, *Université Laval* offered an excellent opportunity to test the EDS-IA. Indeed, after ten years of internal work on sustainable development, many initiatives had been undertaken and several stakeholders had already integrate sustainable development principles and indicators into their activities. The challenge then was to think about how to improve existing achievements and to plan new and more effective actions.

During the academic year 2016–2017, the three stages of the EDS-IA (diagnosis, mobilization and ideation, see Fig. 4) were respectively covered by the three flagship activities of the *Institut EDS*: Fall University, Annual Symposium in Spring and the Summer School. The first activity, the 2016 Fall University entitled "The campus of Laval University in the light of Sustainable Development Goals", took place on November 3th and 4th. »It was organized by the EDS Institute in collaboration with the Chair in International Development and the Executive Vice-President of the university, who was responsible for the sustainable development strategy at Laval University since 2008. This activity put together thirty graduate students from different disciplines along with members of the university staff, public officials and professionals, to share their knowledge and skills and to formulate new ideas to better address SDGs on the campus.

The groups started by the appropriation of the elements of the graphic by identifying links in existing activities. The event concluded by formulating proposals to improve student residences, encourage the use of active and collective transportation, and create a "nourishing campus" (Fig. 5). The information gathered and the contacts made for the organization of this first event made it possible to identify the necessary elements to carry out a diagnosis of the campus that was completed during the following months.

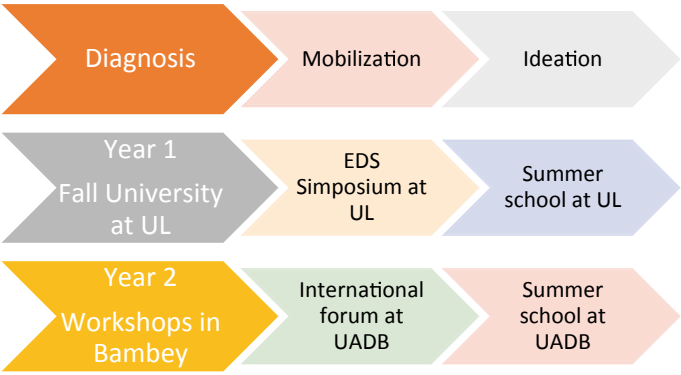

Fig. 4 Workflow of the three steps of the EDS-IA during the two first years

Fig. 5 Appropriation of the conceptual diagram during the diagnosis in 2016

The second step was carried at the EDS symposium in the spring 2017. Researchers from different disciplines presented researches conducted on *Université Laval*'s campus on the use of energy, night lighting and the reuse of waste among others subjects. Additionally, representatives from three Quebec universities explained their approaches and strategies for the integration of sustainable development in their respective campuses. Finally, the question of how to transform the campus into a "living laboratory" was discussed in a workshop.

The cycle of the first year of the EDS-IA implementation culminated in the completion of a three-day summer school in August 2017 during which about fifty participants proposed projects to transform the campus into a "living laboratory". This last event of the cycle focused on ideation, and built on the results of the two previous steps. During the first day of the summer school, the participants traveled the campus to meet with representatives of administration and services units who inform them on the challenges of the existing services (energy, housing, catering, transport, etc.). Such collaboration with the staff and authorities of the university was the result of the work done in the previous stages. At the end of the event, participant have formulate seven projects to transform the campus into a living laboratory by promoting the achievement of the SDGs for its users (Fig. 6).

Fig. 6 Summer school "Inhabiting a Nordic campus: let's imagine our future in a living laboratory"

4.2 Year 2: 2017–2018—Université Alioune Diop de Bambey, Sénégal

In February 2017, *Institut EDS* received a postdoctoral fellow from *Université Alione Diop de Bambey* (UADB) that realized his postdoctoral project on the adaptation of EDS-IA to his university. In July 2017, he started the process in Bambey with the organization of two workshops. The first workshop brought together students, staff members and teachers at the UADB and residents of the municipality of Bambey attended the second. Using the conceptual scheme, participants collectively identified the priority SDGs for the university and for the municipality and imagined possible solutions (Diop and Mbengue 2017).

The results obtained during these two workshops showed the relevance of transferring the EDS-IA in an international context. Despite the great differences between the realities of the two universities, both have similar needs in terms of knowledge of the SDGs and collaboration between disciplines and stakeholders from different backgrounds. According to these results, it was decided to continue the steps of the process and to complete the cycle with a forum and a summer school that were held in June 2018.

For those activities, eleven students from three cycles and several disciplines of *Université Laval* joined ten students of the UADB program of sustainable development and organized five teams. Each team worked on one of the five SDGs prioritized for the commune (2, 3, 6, 7, 8). A sixth SDG (11: sustainable cities) was chosen to integrate the results of the other five SDG. The five teams continued the diagnosis initiated with workshops in 2017, by analyzing existing reports on the status of the SDGs in Senegal and in Bambey. Once in the field, the teams realized a visit of the commune and met local government officials, community organizations, commune service managers, as well as residents to complete the diagnosis of the five SDGs.

The summer school was held in the framework of the International Forum on the SDGs carried out by UADB on June 19 th and 20 th. With the nearly 30 speakers and about 100 participants, the forum served as knowledge mobilization stage.

Finally, about a hundred participants from speakers and audience of the forum and representatives from local organizations joined the student teams to achieve the ideation step during a one-day workshop at the end of the forum, the living

Fig. 7 Summer school "Make Bambey a living laboratory for the SDG"

laboratory held on June 21. The five extended teams formulated ideas for improving the achievement of the five SDGs and integrating them into SDG 11. The integration team formulated the proposal to develop a plan, which would be supported by the partnership between UADB and the City of Bambey. This plan, that would contain the projects proposed by the other teams, was named *Cingeen Bokk* (in Wolof) which means "Everyone is part of it". The plan would contribute to realize the vision adopted in the declaration emitted by the participants of the forum, that of "making Bambey the first ecological city of the Sahel" (Fig. 7).

5 Contribution and Perspectives

5.1 Universities as Living Laboratories for SDG

The first two years of implementation served to test the basic postulates and the relevance of EDS-IA in universities. It has been found that universities have great potential to integrate the SDGs into all their fields of action, whether in research and training as primary missions, but also through their operations and increasingly through the links with the communities and territories where they are located. Matching these four pillars of university action to the SDG can position universities as major actors in transforming global society towards a more sustainable model. In turn, this positioning will promote the relevance of the research conducted and the attractiveness of the studies offered by universities (SDSN 2017).

This double benefit will be further strengthened as the four intervention components are mutually fed and reinforced by a living laboratory approach. Thus, listening to the needs and concerns of the community, reinterpreted in the light of the social vision validated globally by the SDGs, makes it possible to bring out new responses in interventions on university campuses. These new interventions, designed and implemented in collaboration with researchers, students and all types of stakeholders, help to identify the knowledge to be mobilized and the new research questions to be developed. Finally, this whole process is a privileged means of learning and for the development of KCS and all skills needed for the transformation of society.

5.2 Participatory and Interdisciplinary Action-Creation

Finding solutions to achieve sustainable development requires the mobilization of all disciplines. Intense collaboration between sciences is needed to understand interactions between social and natural systems and to find ways to harmonize them. The ability to work in an interdisciplinary way is a skill that is increasingly required for researchers and professionals. However, most university curricula remain disciplinary based and do not offer many opportunities to develop interdisciplinary skills.

The first condition for interdisciplinarity is communication. The EDS-IA mobilizes participation techniques that focus on listening and respect for the spoken word and collective decision-making. It encourages the sharing of all types of knowledge (practical, scientific or traditional), which implies that participants should make the effort to communicate their knowledge in an accessible and precise language.

The identification and choice of projects is a collective creation exercise that aims to promote action. Inspired by the intense creative exercises practiced by conceptual disciplines such as "architectural charrettes", this approach aims to maximize the power of mobilization or generation of knowledge to reach a collectively designed goal.

5.3 A Qualitative Approach to Complete Quantitative Ones

An important aspect of the SDGs is its quantitative nature, expressed in its targets and indicators as a global monitoring effort with a common frame of reference. These data are the basis of the work of many international research teams that are deeply analyzing interactions between SDGs and their targets, as well as the impacts of these interactions for policy research and decision-making (Nilsson et al. 2016; Dodds and Bartam 2016).

These analytical approaches, based on granular data, make it possible to formulate models of interaction between SDGs to foresee the possible effects of sustainable decisions. Their results can be very useful tools to evaluate policies and to choose between several possible actions in planning exercises. However, the information generated with this kind of approaches may be difficult for a broad population to access, which does not facilitate participatory processes.

Unlike analytical and quantitative approaches, EDS-IA builds on the SDGs as a comprehensive framework for action to integrate the three pillars of sustainable development. Moreover, by adding the concepts of environmental limits and social floor, it forces to take into account global scientific and statistic data. Based on a qualitative approach and on the knowledge of the participants, this approach allows both novices and experts to realize the contribution of their own actions to a global process and to identify ways to improve existing initiatives to make them more meaningful and effective.

5.4 Governance as an Integrating Element

The two years of implementation of the approach have shown that effective collaboration of stakeholders in sustainable development, even in the case of private actors or in the academic community, requires the presence of effective institutions with clear guidance and relevant and robust coordination and monitoring mechanisms. In both universities experiences, proposals that emerged have put governance at the core.

Thus, at *Université Laval*, the proposal of one of the teams specifically concerned the creation of a vice-rectorate devoted specifically to sustainable development to ensure the realization of the proposed projects. At UADB, the methodology planned to articulate all the proposals by choosing SDG 11 (sustainable cities) as an integrating element. However, in the course of the exchanges, the integration tool proposed by the participants was a participatory development plan. This leads to add SDGs 16 and 17 to highlight the importance of effective institutions and partnerships.

In both experiences, the process proved to be particularly relevant to inform and raise awareness in a large number of participants who, despite their interest and commitment to sustainable development, were not aware of the existence of the SDGs or did not feel concerned by this framework. This bottom-up exercise oriented to civil society is complementary to other existing capacity-building tools, must of which have public administrations as the primary targets.

6 Conclusions

Although the growing scientific understanding of environmental challenges and the multiplication of individual actions to redress the unsustainable trends, humanity still lag behind in its quest for sustainable development. The SDGs provide a system of key indicators that can be used as a dashboard of public decisions. However, the link between individual actions and global impacts can only be achieved by improving the effectiveness of collective action.

Knowledge sharing and collaborations between actors in all fields and sectors are major drivers of change in society. Collective creative exercises promote teamwork skills and the emergence of transformative initiatives. EDS-IA combines these elements to offer meaningful and inspiring meeting opportunities that can serve as a trigger for a process of collective transformation towards a more sustainable society.

Universities can play an important role as drivers for the implementation of the SDGs. Approaches considering universities as “living laboratories” as the EDS-IA does, are proving to be effective tools for concrete and integrated intervention design for sustainability.

The first two years of implementation of the EDS-IA allowed to identify the relevance of this approach to facilitate linking stakeholders and disciplines and to encourage collaborations and action. It should be noted, however, that the ideas

that emerge during the co-creation processes achieved with EDS-IA, must be transformed into more elaborate projects and then into concrete actions. These stages of development and implementation are not part of the process for the moment, which does not allow to measure concrete impacts.

With regard to key competencies on sustainable development, as literature shows for all kind of competencies in education, it is difficult to determine to what extent the activities carried out under the EDS-IA contribute to developing these skills. Especially since the activities organized by *Institut EDS* are still uncredited and are not part of the regular study programs.

However, the collaborations with professionals and government authorities established over these two years allow us to remain optimistic about the viability and feasibility of ideas that emerged during the process. We already know that at least one of the projects proposed at the Bambey Summer School has received support from the UADB Entrepreneurship Project Support Unit.

On the Quebec side, the experience drawn attention from observers from different backgrounds. Thus, the institute is currently exploring the possibility of transferring the approach to schools in the province. In addition, the third year of the process (2018–2019) has now begun in collaboration with the City of Quebec and many partners from the provincial and federal governments. It will focus on conservation and enhancement of biodiversity as a driver for the promotion and implementation of all SDGs in a strategic area of the city.

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