RESEARCH ARTICLE

Identifying key issues for university practitioners of garden-based learning in Spain

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ABSTRACT

The presence of learning gardens in Spain is growing, and the current scenario is highly diverse in relation to issues such as participatory models or purposes, among others. In the context of the 1st National Meeting on *organic learning gardens*, we convened eight expert practitioners in a focus group. Their discourse was analyzed through content analysis, after which four categories were selected for co-occurrence analyses. The most important questions for university garden-based practitioners in the country are presented, related to actors involved, functions that gardens fulfill, strengths of these educational resources, and requirements for their consolidation.

KEYWORDS

Agroecology; degrowth transition; higher education; organic learning gardens; sustainability education

Introduction

Garden-Based Learning (GBL) encompasses "programs, activities and projects in which the garden is the foundation for integrated learning, in and across disciplines, through active, engaging, real-world experiences" (Desmond, Grieshop, & Subramaniam, 2004, p. 7). A more recent definition states that "Garden-based education is a philosophical orientation to teaching and learning that uses gardens as the milieu for student engagement through meaningful and relevant curricular and instructional integration in schools" (Williams, 2018). GBL might be considered a strategy of Environmental Education (EE), since it meets the main characteristics that have been identified for it (Stevenson, Brody, Dillon, and Wals (2013): interdisciplinarity, development of participation and taking action, takes place also within non formal or informal public domain settings, and has both a local and a global orientation. Recently, it has been underlined that EE conducted in formal contexts should lead to the establishment of *learning communities for action*, which are essential elements for change (Varela-Losada, Vega-Marcote, Pérez-Rodríguez, & Álvarez-Lires, 2016). Gardening is manifested in a variety of grassroots practices –slow food, community supported agriculture, etc. (Williams, 2018), and thus, GBL may also accomplish this relevant trait. In Spain, learning gardens have proliferated since the 1990s at primary and secondary education institutions (Escutia, 2009). More recently, they are also being introduced in higher education, mainly as innovative science learning contexts in Initial Teacher Training programs (Eugenio & Aragón, 2016).

Most worldwide educational research on GBL has centered on two main topics. The first is whether it improves students' academic outcomes (Klemmer, Waliczek, & Zajicek, 2005; Smith & Motsenbocker, 2005), with a focus on low-income schools (Camasso & Jagannathan, 2018; Wells et al., 2015). Williams and Dixon (2013) conducted a review of the literature on this topic, finding that 83% of studies (33 out of 40) report positive effects on learning outcomes, mainly on science subjects. The second issue is

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whether garden-based nutrition programs improve knowledge and attitudes towards fruit and vegetable consumption in children and teenagers. Recent meta-analyses on this topic are those by Berezowitz, Bontrager Yoder, and Schoeller (2015), Davis, Spaniol, and Somerset (2015), and Ohly et al. (2016). In the first, 12 garden studies were identified, and in all of them, improvements in predictors of fruit and vegetable (FV) consumption were reported (Berezowitz et al., 2015). In the second, 13 studies were examined, and all of them showed clear and consistent effects on improving dietary behaviors linked to increases in FV intake, but only half of them showed actual increases (Davis et al., 2015). Ohly et al. (2016) reviewed 40 articles, including quantitative (21), qualitative (16) and mixed methods studies (3), and reported limited evidence for changes in FV intake that moreover were exclusively based on self-report. These three systematic reviews agree to point that there is a need for more robust quantitative research. Finally, Schneider, Pharr, and Bungum (2017) reviewed 11 studies, and their findings suggest that gardening programs should include a nutritional component to result in enhanced nutritional knowledge and FV consumption.

One of the main reasons for this resurgence of gardens is the need for outdoor spaces for children to play in and experience nature (Williams & Dixon, 2013). Promoting children's contact with nature is currently considered a priority of EE, and *naturalizing school environment* has been strongly recommended by the International Union for Conservation of Nature (IUCN, 2016). Empirical evidence supporting the importance of contact with nature has been provided by studies in the field of Environmental Psychology; following the Attention Restoration Theory, natural environments provide restorative experiences, including the opportunity for serious reflection and the recovery of directed attention (Berman, Jonides, & Kaplan, 2008; Kaplan, 1995). A range of psychological well-being and cognitive benefits are shown by existing literature, as Keniger, Gaston, Irvine, and Fuller (2013) conclude after their review. Thus, experiences in Nature may promote learning by improving learners' attention, levels of stress, self-discipline, interest and enjoyment in learning (Kuo, Barnes, & Jordan, 2019). Studies have been conducted to assess the effects that natural or naturalized environments might have as a stress defense in children, some of which specifically focus on green schoolyards (Chawla, Keena, Pevec, & Stanley, 2014). A recent review suggests that they improve mood and cognitive functioning (Collado & Staats, 2016).

Additionally, regular contact with nature may be necessary to develop a sense of connectedness which in turn would condition environmental concern and ecological behavior (Dutcher, Finley, Luloff, & Johnson, 2007). Considering that children spend a large part of their time at school, gardens may play a key role regarding their wellness and ecological consciousness (Collado & Corraliza, 2016). However, there is still a lack of empirical studies focusing on relations between GBL and the development of positive environmental attitudes and behaviors. Williams and Dixon (2013) found 15 studies that had examined this topic, 11 of which revealed positive effects. Nevertheless, conclusions were considered to be compromised by different research methodology weaknesses, which have also been underlined by other authors (Fisher-Maltese & Zimmerman, 2015).

In Spain, EE seems to be relevant for GBL practitioners, since the existing literature includes didactic implementations framed in currents such as Education for Sustainable Development, School Agroecology, and Education for Degrowth. Internationally, learning gardens have been related to sustainability education at primary and secondary education (Williams & Brown, 2012), and at higher education (Duram & Klein, 2015; LaCharite, 2016). Since the European educational system is based on competence development, some practitioners have proposed gardens as appropriate environments to develop students' competences for sustainability (Eugenio, Zuazagoitia, & Ruiz-González, 2018). School Agroecology constitutes another approach: it is defined as the didactic transposition of Agroecology (Llerena & Espinet, 2017), considered as science, agricultural practice, and social movement (Wezel et al., 2009). It proposes integrating knowledge and practice on food production systems into programs and schools (Rekondo, Espinet, & Llerena, 2015). Education for Degrowth questions whether sustainability can act as a reference for social environmentalism. Following this approach, some Spanish authors propose using school gardens as a tool for achieving fair and orderly downsizing (Rodríguez-Marín, Fernández-Arroyo, & García, 2015). Moreover, some universities host community gardens where creative and innovative educational

practices occur, aiming to develop ethical care (Torres & Soto, 2016) or to promote reflection, critical debate, and social participation in food sovereignty (Martínez-Madrid & Sanz-Landaluce, 2016). Overall, it is evident that the current scenario of learning gardens in Spain is highly diverse. Hence, we aim to identify the themes that are more pressing and important for GBL practitioners, by analyzing the discourse of a nation-wide panel of experts convened in a focus group.

Methods

Research context

Spanish GBL practitioners started coordinating efforts at a national scale in 2015, founding the association *Network of Cultivated Universities* (Eugenio & Aragón, 2017), initially promoted by lecturers, but open to and including a range of professionals from non-formal, primary, and secondary education. In May 2016, a national meeting was organized in the city of Soria (University of Valladolid), entitled *1st Meeting on Organic Learning Gardens* (OLGs). The concept of *Organic Learning Gardens* (OLGs) was coined to underline two main aspects: (1) that the main function of these gardens is not production, but education, and (2) that the association is committed to sustainable land practices in order to contribute to developing students' environmental consciousness. It also involves that two domains of knowledge are required in order to implement OLGs: education and land management.

Procedure

A qualitative approach would allow us to understand in detail the meanings that experts attribute to our research topics. Since our aim was to obtain the diversity of perspectives generated from their face-to-face interactions, data was collected using a focus group (Marshall & Rossman, 1999). Focus groups "are contrived settings, bringing together a specifically chosen sector of the population to discuss a particular given theme or topic, where the interaction with the group leads to data and outcomes" (Cohen, Marion, & Morrison, 2011, p. 376). They allow insights on a particular issue, and a wealth of data from multiple sources can be collected in a short time (Escobar & Bonilla-Jiménez, 2017).

The focus group was designed by two of the authors by following specialists' recommendations (Cohen et al., 2011; Escobar & Bonilla-Jiménez, 2017; Tójar, 2006). Eight selected experts were convened, all of them being active practitioners who had either founded or had promptly involved themselves in the *Network*. They were provided with the following questions in advance, in order to promote reflection and preparation of discourse: (Q1) Who implements learning gardens in Spain, and how and for what purposes?; (Q2) In your view, how can these gardens be defined and what role do they play?; and (Q3) What form can/should they take and what role can/should they play in a near future?

The session was conducted by one of the authors, lasted one hour and forty-five minutes, and experts had no time limit on their interventions. The session was recorded and transcribed in a single document which was subsequently divided into individual speeches. Additionally, another 2 documents corresponding to written answers to initial questions by two of the experts were also included for analysis, and considered as participation "b" of the same expert.

Data analyses

Data analyses were conducted by the three authors with the software Atlas.ti v7.0 (Friese, 2013). Initially, we used *content analysis*, a technique within the sociological tradition of qualitative research that considers the text as a window to human experience, rather than an object of analysis itself (Ryan & Bernard, 2003).

In a first stage, the *descriptive phase*, data were coded. Coding fragments the text into categories of topics and forces researchers to evaluate every single quote, and to determine how they contribute. Coding

involves deep reflection, analysis and interpretation processes on data meanings (Miles, Huberman, & Saldaña, 2014). *Open coding* was used, consisting of searching for the content categories that had initially been defined as *fitting research purposes* (Cohen et al., 2011; Hoepfl, 1997), together with others that emerged by inference. Inductive processes are characteristic of qualitative research that draws on data to "rebuild" reality as it is observed by the actors of a certain social system. First order codes (*subcategories*) were defined and then sorted into a lower number of second order codes (*categories*), whose definition was agreed by researchers. Finally, four categories were selected based on their quantitative representation and substantive meaning to conduct further analyses.

In a second stage, the *interpretative phase*, relations between individual topics were searched for, since they allow pointers of contextual factors to be found and help to understand the studied phenomenon (Contreras, 2011). Thus, a co-occurrence analyses was conducted on the four selected categories, which showed the relations between categories and subcategories. Those relations with a higher number of co-occurrences were considered the most representative and were selected to be shown by means of explanatory graphics, as is commonly recommended (Miles et al., 2014). The topics shown were related with one another, meaning that either a quote was in both categories, or that categories were associated, as Contreras (2011) suggests, by enclosing, including or overlapping.

Results

A total of 760 quotes or text fragments were identified as units, which were attributed to 344 subcategories and 31 categories (see Table 1). Since some quotes were assigned to several subcategories, the actual total number analyzed units was of 2022.

Table 1. List of categories and their definitions, number of subcategories, and quotes per category.

Category	Definition	# Subcategories	# Quotes
Concerns	Aspects that concern practitioners	16	238
Strengths	Values or characteristics of the GBL	26	220
Actors	People involved in OLGs	35	211
Functions	Uses of the OLGs	52	201
Agriculture	Terms related to cultivation of the land	16	122
Difficulties	Difficulties found in relation to OLGs	13	107
Social values	Beliefs hold in current society	11	80
Socioeconomic context	Social and economic conditions that surround OLGs	10	76
Training	Instruction required to become practitioners	7	66
Agriculture and values	Specific beliefs linked to agricultural activity	14	56
Teaching	Educational aspects	16	47
Sustainability	Using resources without compromising forthcoming generations' supplies	7	38
Global context	References to global change	2	36
Pedagogical context	Instructive conditions that surround OLGs	8	36
Surroundings	Physical spaces where OLGs are implemented	5	32
Food sovereignty	Right of people to healthy and culturally appropriate food	4	31
Education purposes	Aims of educational programs	7	29
Future of GBL	Predictions for putting into practise GBL	5	28
Educational research	Investigations regarding OLGs and the GBL	7	26
Experience assessment	Evaluations of individual GBL practises	10	20
Food	Aspects related to feeding	8	20
Garden assessment	Evaluations of gardens as educational resources	5	19
Learning dimensions	Knowledge about GBL	5	19
Stage	Educational stages in which OLGs are used	7	18
Management models	Organising and running gardens	15	15
Pedagogy	Pedagogical principles applied to GBL	7	14
Participation models	The way in which actors are involved in OLGs	11	11
Garden types	Types of gardens	7	7
Roles of university	Aspects related to higher education's responsibilities	4	6
Subjects	Topics or matters in which OLGs are used	3	6
Area	Surface extent	3	4

Taking into consideration quantitative weight (number of quotes included) and contribution in relation to research objectives, four categories were selected to conduct the co-occurrence analyses. These were *Actors*, *Concerns*, *Functions*, and *Strengths*.

(1) Actors: Plurality and coordination

This category referred to people involved in the creation, development, and engagement with gardens, and grouped 35 subcategories. The co-occurrence analyses revealed four different concepts (see Figure 1): *Diversity*, *Teachers*, *People with Special Educational Needs*, and *University Students*.

The participants (listed as P1, P2,… hereafter) highlighted that a diversity of actors are involved in the establishment, development, and educational use of gardens currently in Spain. Besides teachers and students, the GBL field extends to actors such as caretakers, parent associations, other types of associations (people affected by mental illnesses or with special educational needs), social entities, governing bodies (rectorates at university; city, town and provincial councils), farmers, and some specific figures such as agro-environmental educators, or municipal garden coordinators. Expert practitioners see gardens as spaces that "demand coordination between a number of actors" (P6:54), and generate an "enriching" number of interactions among different actors (P1:123).

It was underlined that the initiative of creating and maintaining a garden was too frequently led by a single teacher at preschool centers (P7), and by one or several science teachers at primary and secondary centers (P7 & P5b). This was considered to evidence the lack of support from governmental institutions (P3). At higher education, participants distinguished between two types of gardens: one initiated and maintained by students (P7), and another by teachers of Natural Science in Initial Teacher Training programs (P5, P6, & P7). The use of gardens in Initial Teacher Training was considered positive, since a trained new generation of teachers will be capable of implementing GBL at schools (P4). Finally, the usefulness of gardens for people affected by mental illnesses, and children with special education needs were also underlined (P1); gardening with them was considered to be a very positive experience (P1).

The following intervention summarizes some of the key themes that were discussed and collected in this category:

> Well, I see this variety of initiatives, beginning with teachers that are leading their gardens alone…and undergraduate teachers that are being trained at universities…and others that have farmed as a family tradition…and I think that the pattern is diversity…there is a huge diversity (P4:1)

(2) Concerns: Lack of institutional support and legitimation

This category included needs or duties required for consolidation and further development of OLGs, and included 16 subcategories. The co-occurrences analyses revealed two main concepts: *Institutional support* and *Legitimation* (see Figure 2).

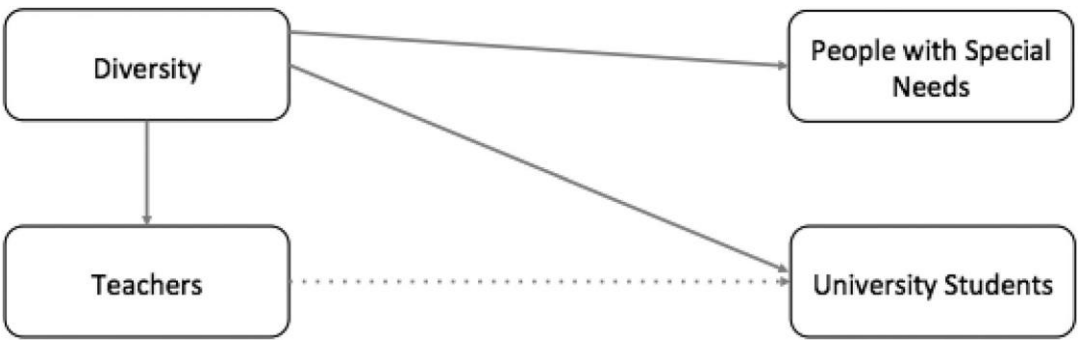

Figure 1. Diagram of relations among concepts resulting from the co-occurrence analyses on the selected category actors.

Participants agreed that learning gardens need to gain legitimacy. One of them used the expression "fight for the land" to refer to the difficulties that are currently faced when establishing and maintaining a garden in an educational institution, because its academic value is still under question. This seems to apply particularly to higher education, since gardening at university is not considered appropriate by some: "We need to increase the visibility of an activity that we have been somehow hiding, to not bother or offend anyone on campus" (P6:77). To that end: "We need to work progressively and consistently for everyone to understand that food production is a part of the strategies and processes of sustainability at university campuses" (P7:126). Thus, in order to gain institutional support, one participant proposed appealing to sustainability offices (P6).

Institutional support, in a wider sense (from councils, faculties, sustainability offices, etc.), was considered to be the key factor for consolidating and promoting OLGs. As Participant 4 stated: "learning gardens are not anecdotal, they constitute significant agroecological experiences" (P4:39).

(3) Functions: A vast array of possibilities

This category referred to principal roles, purposes or uses that gardens currently fulfill in Spain, and included 52 subcategories. The co-occurrence analyses revealed seven main concepts: *Embracing Living Processes*, *Transformation/Improvement*, *Activities in all Educational Stages*, *Generating Occupation*, *Revitalizing Rural Areas*, *New Educational Spaces*, and *Ways to Engage with Food Production* (see Figure 3).

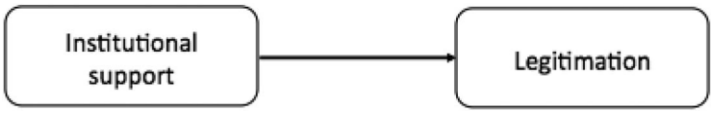

Figure 2. Diagram of relations between concepts resulting from the co-occurrence analyses on the selected category concerns.

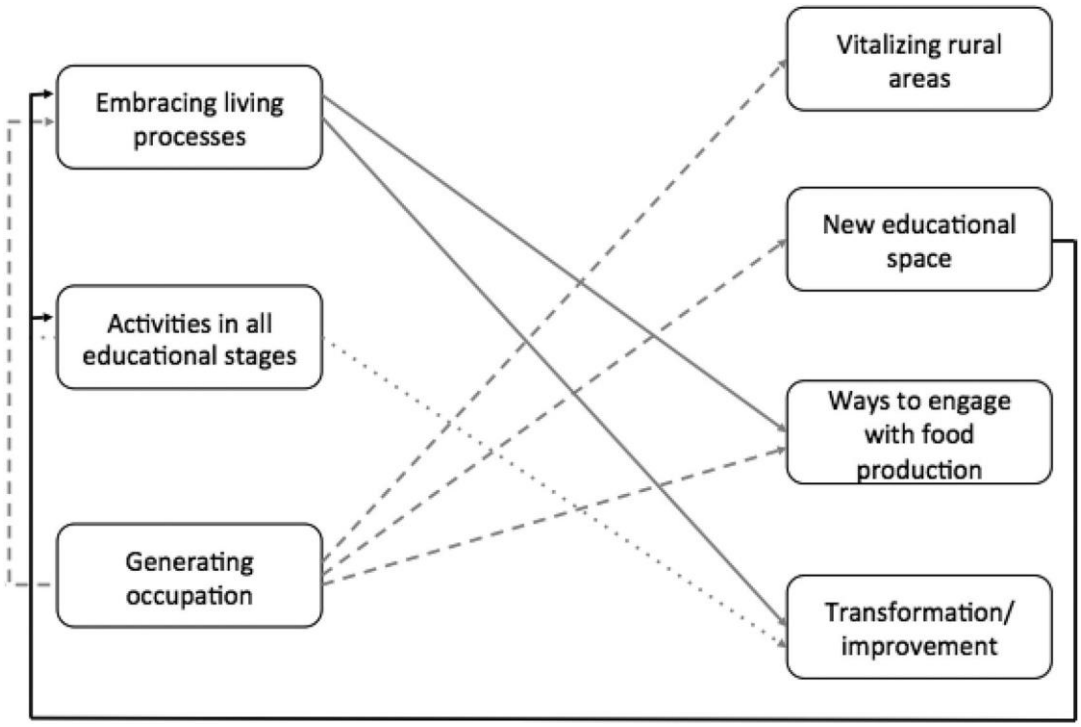

Figure 3. Diagram of relations among concepts resulting from the co-occurrence analyses on the selected category functions.

Participants understood gardens as new educational spaces where suitable activities for all educational stages can be conducted: "Many activities from curricula for all stages can be implemented from learning gardens" (P7b:37). "Gardens constitute spaces to educate and help develop students' competences" (P7:76), or "gardens are a tool both for learning and for personal transformation" (P6:61) were some of the definitions given by participants.

Moreover, OLGs both embrace living processes and provide ways to engage students with food production, which was considered transformative: "Truly, gardens are a key for educational transformation" (P5:23), since (using gardens) "involves a will to change, and to understand that the way things are done in education can be improved" (P6:66), or (gardens allow) "a creative way of involving students in food production" (P5b:32).

It was argued that agroecological knowledge is useful at a personal level to produce food for self-consumption and can sometimes involve complementary financial gains (P2). Moreover, it was also suggested that it can generate occupation in rural areas and in educational contexts, where the figure of agro-environmental educators has emerged and should be further developed and supported with specific training (P2). A participant explained the experience of someone who had left Madrid to start farming in a rural area: "My friends told me I was crazy, that I was going to end up destitute", and "now they envy me, since I'm 28 years old and have my own house, and economic independence (…) I can keep going on with my life" (P2:28). He also claimed that:

> The level of personal satisfaction is incomparably higher to that of a person who earns a little bit more money but who works in a factory, in the service sector, or for a company, where they have to do what they're told (…) and very few people, even graduate students, are able to decide what they want to do and how to do it. It does have drawbacks, don't get me wrong, it's not a walk in the park (P2:70).

(4) Strengths: Personal and social development

This category referred to individual values that are promoted by GBL and that expert practitioners considered to be a strength of OLGs. After the co-occurrence analyses, 4 main concepts were identified: *Cooperation-collaboration*, *Creativity*, *Empowerment*, and *Time availability* (see Figure 4).

Cooperation-collaboration repeatedly appeared as a main feature of OLGs, in a variety of senses. The cooperation between actors was considered necessary to create and develop a garden (P6), GBL was considered to involve cooperative learning (P6 & P7b), and to educate for cooperation in a global context of uncertainty (P1), in such a way that small communities of practitioners develop abilities to organize themselves:

> Gardens are schools of participatory democracy, that is, real spaces where, on a small scale and with your closest community, you can put democracy into practice. You form an assembly, take decisions, carry them out, develop participatory budgets… (P1:171)

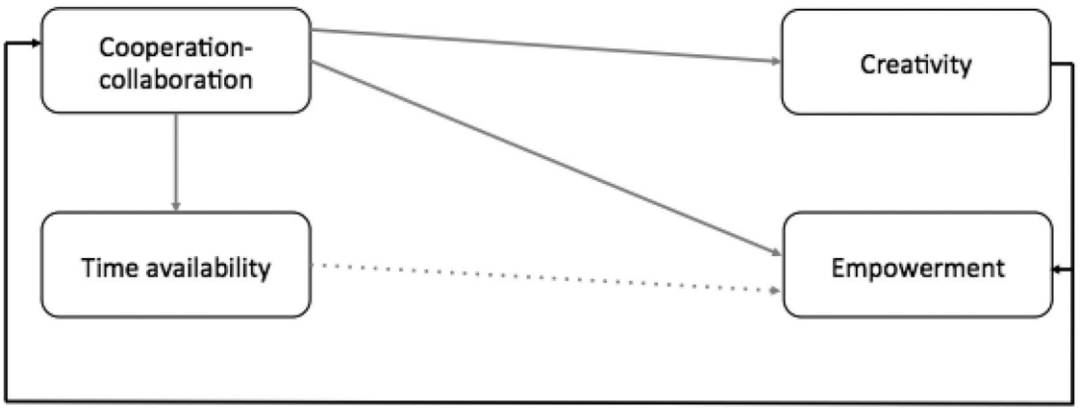

Figure 4. Diagram of relations among concepts resulting from the co-occurrence analyses on the selected category strengths.

Moreover, participants associated cooperation with creativity:

> Many of us share a common dream (…) and the beautiful thing is that, as the dream is co-created, nobody can really know how the garden is going to develop. We can dream, and give it a try, and in 5 years' time we will be able to look back and reflect on our dreams and what we finally achieved, and the things we had not even dreamed about and have however appeared, because gardens are creative space where dreams come true (P8:66)

The concept of empowerment also appeared in various senses, for instance: "People working with gardens are an example that it can be done" (P8:93), and "GBL generates people capable of transforming societies, instead of reproducing the current model" (P1:175).

Finally, gardens were considered to be valuable places where leisure time can be spent. In this regard, a participant stated that being involved in a garden helps develop the ability to manage one's own time:

> We are devoting time to what we really want and we own our own time (…) we celebrate a kind of leisure time which is creative and constructive and is not taken up by consumption (P8:110)

Discussion and conclusions

In this paper, we have made attempts to link expert GBL practitioners' practical knowledge and understanding of the current actors, concerns, functions, and strengths of learning gardens in Spain. Expert practitioners consider that gardens are new educational spaces where activities for all educational stages can be implemented, and students' competences developed. Two characteristics of OLGs are particularly distinctive: they embrace living processes, which involves life lessons (Williams & Brown, 2012) and they provide close contact with nature, advocated by conservationist institutions (IUCN, 2016). They also provide ways for students to engage in food production, thus responding to a fundamental need identified by School Agroecology (Llerena & Espinet, 2017). A vast range of actors is involved in GBL, including farmers, teachers and students, associations, governing bodies, and specific figures such as agro-environmental educators. Thus, implementing OLGs requires these actors to cooperate with one another, which results in enriching interactions and partnerships.

The use of OLGs is considered transformative in various senses: at a personal level, experts underlined that it promotes the abilities required for cooperation, develops creativity and provides tools to earn a living, thus empowering. Similar observations have been made in a range of previous studies (Williams & Dixon, 2013); creativity was recently underlined in a Swedish study (Almers, Askerlund, & Kjellström, 2018). At a social level, it gives rise to emancipatory education, enabling students to transform current models, and provides opportunities to revitalize rural areas through new projects related to farming, as already suggested by Orr (1991) and supported by Agroecology (Wezel et al., 2009) and Degrowth (Latouche, 2007, 2012). Overall, experts consider that the growing use of OLGs responds to existing needs for personal and social transformation.

Despite all such valuable characteristics, expert practitioners recognize the existence of several drawbacks to creating and maintaining OLGs, and underline that gaining legitimacy is necessary to achieve the institutional support that would consolidate GBL in the country. Legitimacy is considered by them to be linked to garden's academic value and contribution towards sustainability, two aspects that have already been approached (Duram & Klein, 2015; Williams & Dixon, 2013), but about which it is still necessary to convince educational and governmental institutions. As Williams (2018) highlights, GBL would benefit if longitudinal and large-scale research studies could demonstrate instructional and curricular rigor, and impact on learning outcomes; however she concludes that such research studies are still missing, largely due to marginalized status of learning gardens, and to the decentralized and localized nature of garden-based programs implementation.

Thus, there seems to be a positive feedback between these two factors (lack of legitimation and lack of opportunities to gain it) that needs to be addressed. Existing literature points that top-down approaches would not be a solution, and confirm the importance of individual school environments as determinants of garden's establishment and sustainability along time (Davis et al., 2015). Thus, support should be given to instructional centers aiming to initiate and use a learning garden. Such support is considered insufficient in Spain, and has been identified as a main obstacle for the success of school gardens in the USA (Diaz, Warner, Webb, & Barry, 2018).

Overall, a movement related to GBL appears to be flourishing in Spain, as indicated both by the foundation of the *Network of Cultivated Universities* and by the interest generated by its first meeting at the national level. This movement is fostered by a range of actors from a variety of backgrounds but who agree that OLGs are highly valuable educative resources whose implementation involves significant personal and social shifts, and who are demanding support from institutions to consolidate their use as fully legitimate learning environments. A limitation of this work is that the perspectives presented proceed from eight professionals, and not from a broad population of actors involved with OLGs. Although participants were selected on the basis of their commitment to learning gardens at national level and their visions are undoubtedly significant, other views might not be represented. Additionally, the lack of research on this topic drive us to encourage further exploration of it.

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