SCHOOL GARDENS: PROMOTING ACTIONS FOR BUILDING INNOVATIVE LEARNING COMMUNITIES OF PRACTICE

Nektarios Tsagliotis, Primary Science Laboratory at the 9th Primary School of Rethymno, Crete, Greece

1. Background and Introduction

I started building a school garden at the back yard of my school about 10 years ago and ever since it has become a year-round educational programme with impact in the lives of learners, teachers, school communities and organisations. It has tuned out to be a long standing commitment, which promotes innovation linked with formal, non-formal and informal teaching and learning activities, alongside with the building of communities of practice for sharing common interests, knowledge, skills, competences and the joy of learning in the field.

Figure 1: The school garden in its initial phases, with built (back) and wooden raided-beds (front) and a greenhouse

Figure 2: Children planting beans in wooden raised-beds in the school garden, which they have started from seed plants

During the school year 2014-2015 a National educational scenario contest has been conducted, under the Institute of Educational Policy (IEΠ) with the title *"School gardens and raised beds: production and disposal of agricultural products"*, with the support of GreeNET and ISE. I acted as a promoter and facilitator of this contest in an attempt to build a community of practice out of this contest. In the beginning of June 2015, eight (8) school scenarios have been selected, amongst others submitted, applying the evaluation criteria described in the contest announcement document. The schools range from kindergarten to primary and secondary, as well as one lyceum. Ten (10) teachers from these schools were selected to attend the summer school conducted at the Primary Science Laboratory in Rethymno Crete (http://efepereth.wikidot.com), during the period of 21st-25th of June 2015.

2. School gardens as teaching and learning sites

A school garden, needless to say an organic school garden, offers a place to enrich teaching efforts with powerful hands-on activities and experiences that make learning come alive, ideas and concepts come into being. Developing a school garden is not rocket science, neither a "build-it-and-it-will-come" endeavor, but rather an exercise which presents a certain level of complexity and must be "child-generated" in order to be "child-owned". If children lack ownership, they will lack a sense of stewardship. Sustainability requires stewardship. If the garden is to be used, respected and cared for, then stewardship is the key. The foundation of success is not necessarily in proper construction or sound plant selection. Although these are important dimensions of successful organic gardening, it appears that it is not so much the garden, but rather the garden programme and the integrated activities that matter and make the difference, raise the educational added value. Successful (organic) school gardens are built on the foundation of committed people, bearing in mind that although *"there might not be a garden in every school, but there is definitely a school in every garden"*.

Even a century ago, Dewey, in "Democracy & Education" (1916) contends that *"gardening need not be taught either for the sake of preparing future gardeners, or as an agreeable way of passing time. It affords an avenue of approach to the knowledge of the place farming and horticulture have had in the history of the human race and which they occupy in present social organization. Carried on in an environment educationally controlled, they are means for making a study of facts of growth, the chemistry of soil, the role of light, air, moisture, injurious and helpful animal life, etc. There is nothing in the elementary study of botany which cannot be introduced in a vital way in connection with caring for the growth of seeds."* (pp. 216-217).

Therefore "Garden-based Learning" [GBL], within a context of "Inquiry-based Science Education" [IBSE], can be defined simply as a set of instructional strategies that utilize a garden as a teaching and learning tool. The pedagogy is based on experiential education, which is practiced and applied in the living laboratory of the garden. Moreover, GBL has the potential to enrich basic education in all cultural settings. In cases where it is most effective, GBL is a pedagogy that is used with all children. It has something to contribute to each learning style, and to children at each developmental level. Moreover, it cannot be viewed as a "make work" curriculum for slow learners or socially disenfranchised learners, although it has been shown to be a powerful tool in motivating and educating young people who have been identified with such "labels".

Figure 3: Learning is fun in the school garden, an enjoyable educational setting within the school community

Figure 4: Children producing groceries to be donated to social welfare meals as an act of solidarity to the community

Garden-based learning offers a context for integrated learning. An integrated curriculum is often associated with real-life problems in contrast with a traditional subject–based curriculum. This provides a vehicle for higher order thinking skills as students are challenged to move beyond memorization, to see patterns and relationships and pursue a topic in depth, within a thematic approach. They are engaged in actively and socially constructing and construing knowledge, rather than passively accumulating and accepting information and they also develop analytic and synthetic thinking. At the practical level developing GBL skills raises the importance of (organic) gardening practice, through which children gain firsthand experience with the seed-to-seed cycle, the rhythm and traditions of the harvest, and the taste, touch, and smell of fruits, vegetables, and flowers (Danks, 2010). Proponents of children's garden programs talk of the multiple developmental benefits that school gardens can have on children namely, emotional, aesthetic, and even spiritual in addition to the more obvious social and intellectual benefits, in a variety of contexts (Trop, 2006).

3. Building learning communities of practice

Communities of practice are formed by people who engage in a process of collective learning in a shared domain of human endeavour, in a sense, groups of people who share a craft and/or a profession. The concept was first proposed by cognitive anthropologists Jean Lave and Etienne Wenger in 1991, with the groundbreaking book on situated learning. It is through the process of sharing information, knowledge, skills, competences and experiences within the community that the members learn from each other, and have an opportunity to develop themselves personally and professionally (Lave & Wenger, 1991). Communities of practice (CoPs) may exist in physical settings, for example, a school, a field setting, or elsewhere in the environment, but members of CoPs do not have to be co-located. In fact, there may also be "virtual communities of practice" (VCoPs) when members

collaborate online, such as within discussion boards and newsgroups, wikis, online workspaces and con-folios etc. In a nutshell: *"communities of practice are groups of people who share a concern or a passion for something they do and who interact regularly to learn how to do it better"* (Lave & Wenger, 1991). A community of practice is not merely a community of interest, people who like certain kinds of flowers, for instance. The members of a community of practice are active practitioners. They develop a shared repertoire of resources: experiences, stories, tools, ways of addressing recurring problems, in short, a shared practice. This takes time and sustained interaction amongst all members, at any level of expertise they might be, in a framework of collective responsibility and commitment. Practitioners can address the tacit and dynamic aspects of knowledge creation and sharing, as well as the more explicit aspects. In his later work, Wenger (1998) describes the structure of a CoP as consisting of three interrelated characteristics: 'mutual engagement', 'joint enterprise' and 'shared repertoire' (pp. 72–73). A community of practice can exist as long as the members believe they have something to contribute to it, or gain from it.

Schools and districts are organizations in their own right, and they too face increasing knowledge challenges. The first applications of communities of practice have been in teacher training and in providing isolated administrators with access to colleagues. There is an increasing wave of interest in peer-to-peer professional-development activities and the creation of teachers' learning communities of practice (Grossman *et al.*, 2001). In the education sector, learning is not only a means to an end: it is more likely the end product. The perspective of communities of practice is therefore also relevant at this level. In schools, changing aspects of teaching and learning practice is a much deeper transformation, which inevitably takes longer to accomplish, in a gradual and evolutionary mode.

What makes a teachers' learning community of practice succeed depends on the purpose and objectives of the community, as well as the interests and resources of its members. Wenger *et al.* (2002) have identified several actions that could be taken in order to cultivate communities of practice. Because the nature of a CoP is dynamic, it is important to be designed to evolve naturally and support shifts in focus. It is also important, as well as beneficial, to create opportunities for open dialog within and with outside the community, to enrich perspectives and interact with important agents. It is crucial to welcome and allow different levels of participation in a CoP, such as: a *core group* who participate intensely in the community through discussions and projects, an *active group*, who attend and participate regularly, but not to the level of the leaders and a *peripheral group* who, while they are passive participants in the community, still learn from their level of involvement (most likely to be the majority in a CoP). There should be an attempt to develop both public and private community spaces and participants should explicitly discuss the value and productivity of their participation in the CoP. Influential members of a CoP should coordinate a thriving cycle of activities and events that promote regular meetings (*in vivo* and/or *in vitro*), space for reflection, and evolution of common practices (Wenger *et al.*, 2002). It is significant for members of a CoP to shape their learning experience together by brainstorming and inquiry of the conventional and radical knowledge and wisdom related to their topic, i.e. "school gardens and their impact in school organisations".

4. A community of practice out of the educational scenario contest

The teachers contest organized by Ellinogermaniki Agogi (EA), as previously mentioned, was based on the GreenNET "best case scenario" related to school gardens. Participating teachers had to prepare and apply an educational scenario on the topic and share their ideas and implementation steps with selected participants, within a framework of a summer school. The main objectives of the summer school have been the following:

- to bring together colleagues with relevant interests in school gardens, share educational scenarios and activities conducted during the school year 2014-2015

- to develop and share ideas for further implementation in educational contexts and settings in an attempt to create a teachers' learning community of practice

- to engage in activities, small project constructions, table and virtual games on gardening etc. that have already been developed and extended in several cases

- to familiarize teachers to open educational resources, repositories and authoring tools available for the development of educational scenarios

- to develop ideas for further implementations in action and forthcoming collaborations in European and national projects

At the beginning of the summer school the teachers were introduced to the history and development of school gardening in Greece and in other contexts, based on evidence from available resources (cf. http://efepereth.wikidot.com/garden-resources). During the second and third day of the summer school the teachers got involved in several hands-on projects, activities and constructions. We started from the idea of "hot boxes" as it had been developed in the 18th century, as a basic principle for passive solar constructions, such as greenhouses, solar dehydrators and solar cookers and then we got down to the construction of several such devices (cf. http://efepereth.wikidot.com/solar-cookers and http://efepereth.wikidot.com/solar-dehydrators for example). We also had an introduction to composting and then we created simple decomposition columns out of plastic bottles, whereas we also studied and explored the compost chambers out in the school garden (cf. http://efepereth.wikidot.com/garden-compost). The teachers also got involved in microscope studies linked to the seminal work of Robert Hooke's *Micrographia* (1665), with self made microscopes, where they examined specimens from the school garden, such as seeds (thyme, petunia), plants (leaves, flowers, roots etc.), insects (ants, bees, isopods etc.), with commitment, interest and high enthusiasm (cf. http://efepereth.wikidot.com/hipst). Furthermore, the teachers have been introduced to basic principles of biological pest control, as the beneficial action of predators, parasites, pathogens, and competitors in controlling pests and their damage in the garden plants.

Figure 5: Constructing decomposition columns out of plastic bottles, as an introductory activity to composting

Figure 6: Teachers who participated in the summer school out in the school garden, under the olive tree

During the fourth day of the summer school the teachers were involved in creating educational scenarios with ODS and ISE authoring tools, implementing metadata on their scenarios and practiced uploading them to platforms and repositories. They worked with their laptops and managed to acquire basic skills in these processes, also creating their school repository to use in the coming school year. The teachers were also introduced to the idea of "communities of practice" such as the "My school garden" community (http://portal.opendiscoveryspace.eu/community/my-school-garden-o-sholikos-moy-kipos-70514), or groups of special interest, created in social media (e.g. https://www.facebook.com/groups/1587449181539164/). During the final day of the summer school the teachers presented their work described in the educational scenarios they have implemented in their schools, which are to be uploaded in the community page (http://portal.opendiscoveryspace.eu/community/my-school-garden-o-sholikos-moy-kipos-70514) and in the wiki of the Primary Science Laboratory (cf. http://efepereth.wikidot.com/summer-school-greenet-2015).

The selected scenarios utilized the "best case" approach of school gardens, providing important ideas for further enhancement and elaboration, such as the following:

- project development within a cross curricular subject area, interweaving science, language, mathematics, ICT, geography, arts & design etc., in primary as well as in secondary education
- inquiry based science activities and experimentation from early ages to high school (Lyceum).
- connections with a historical perspective of agriculture and school gardening, throughout the past century, linked with nowadays practices

- provision and cultivation of ideas relevant to sustainability and sustainable development

- sensitization of young pupils in early primary education and kindergarten as well as in children of special needs

- inclusion and application of contemporary gardening techniques, such as hydroponics and composting, conducted within innovation in a school teaching and learning environment

Overall, the teachers enjoyed the content, processes and hospitality of the summer school, making it a successful endeavor, as it is documented in the evaluation questionnaires they have filled in and in their concluding remarks. The need for the development of a community of practice on school gardening has been highlighted and realized as a necessity for further exchange and development, also appreciated in a highly participatory mode of interaction throughout the whole process.

5. References

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