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Community Gardens as a Means of Ecological and Civic Education: The Teachers' Perception on the Concept of Community Garden in School

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Abstract In the 21st century, social responsibility and environmental protection are attitudes that must be developed through education, therefore community gardens present multiple learning opportunities, and their emergence in schools facilitates the human-nature connection. It is a new concept in Romania, therefore the study of teachers' perception on this concept, but also the analysis of the level of openness and involvement in potential activities have been necessary in order to determine the degree of functionality of such a project within the local community. The research has highlighted a positive attitude of the teaching staff along with the desire to get involved in activities related to ecology, gardening, nutrition and even more, despite certain barriers such as the curricula inadaptable to non-formal education and the unconventional space generated by a community garden. Teachers have also proven to be optimistic about the benefits and influence that a school community garden can generate on students' behaviour and attitudes.

Key words

community garden, civic ecology, school gardens

In the speed century, living in an urban agglomeration, being often disconnected from nature, an element which influences the quality of life, the well-being and the social development, we are looking for ways to fight the negative effects of urbanization. This is how the concept of community garden has emerged. Community gardens can be defined as public or private land, managed by a gathering or group of people [27]. Another definition makes reference to community gardens as being open spaces where flowers and food-producing species are grown, being managed and operated by the members of a local community [8]. As a rule, community gardens are located in cities where citizens have limited access to gardening space. They can be located in neighbourhoods, in the yard of educational institutions, hospitals, in residential complexes [27].

In addition to the utilitarian advantage, food production, by promoting a healthy and sustainable lifestyle [23], community gardens play an educational and civic role, as they are based on the principle of volunteering [24]. Community gardens distinguish themselves by their ability to integrate food production with civic engagement and environmental protection [12]. From the educational perspective, they present multiple learning opportunities, either through classical teaching activities or through practical learning activities, but also through direct interaction [12]. The method of observation, but also personal experiences are highly important in the development of academic knowledge [19].

The emergence of community gardens in schools is a movement that has developed in recent years, the researches presenting a number of benefits they generate in educational institutions, such as increasing school results in the field of sciences [28], the increase of fruit and vegetables consumption, improving physical activity [21], but also improving interaction and communication skills [22]. Creative and cooperative activities, performed in nature, have positive influences on mental health, by reducing stress, anxiety and thus contributing to increasing students' self-confidence [2]. A significant number of researches indicate that when the human being is surrounded by vegetation, a number of physiological processes improve, for example, it is noted a better functioning of the immune system [14], the neuroendocrine system [25], as well as a lower blood pressure [9]. The deficit of attention, as well as students' hyperactivity disorders, are reduced when interacting with nature [13]. From an ecological point of view, a community garden involves a series of biodiversity relationships, such as the predator-prey relationship, advancement-degradation, but also various processes such as pollination [1]. The community garden also involves a direct interaction of

students with local fauna and flora, thus attaining the human-nature connection. This context gives rise to the term of civic ecology. Civic ecology refers to the philosophy and science of community gardening, of community forestry, but also other practices or initiatives having the purpose to improve the degraded natural environment, being achieved voluntarily [11]. As a consequence of direct involvement, the environmental issues become real and relevant to them, and environmental protection will thus become a moral obligation [15]. Through gardening, students can realize that any action has consequences [5], for example a flower which is not watered will wither away and it can no longer be brought back to life. A community garden not only contributes to the ecological and civic education of students, but it can also integrate subjects such as mathematics, history, geography, foreign languages or arts [27]. In the case of community gardens within the educational institutions, the teacher is the link between students and the community garden. The teacher is define as the pivot of this community [27]. The community and the local educational environment need new concepts in order to develop, therefore the project Citizenship Lab II - Green Edition, of April Hub Craiova Association, co-financed by the European Solidarity Corps aims to create a community garden within an educational institution, a garden that will provide a non-formal environment for education. The purpose of this study was to analyze teachers' perceptions on the concept of community garden in school, but also to analyze the level of openness and involvement in potential activities that contribute to achieving the benefits generated by a community garden.

Material and Method

With a view to achieve this purpose, a questionnaire was elaborated on the Google Forms platform consisting of a series of questions addressed to teachers: four questions with multiple answers, a dichotomous question and a semantic question, in scale. All six questions were outlined based on the benefits of the community garden in schools. The questionnaire was distributed online to teachers in Craiova, Romania. In order to elaborate the "portrait of the teacher", the questionnaire has also contained a series of information such as age, seniority in education or teaching level (primary, secondary, high school). Thus, 94 teachers answered the questions included in the questionnaire, and the statistical data were analyzed in Microsoft Excel.

Results and Discussions

The first data we have obtained related to the profile of the responding teachers, taking into consideration the seniority in education, but also the teaching level (Figure 1). Most teachers have more than 10 years of experience in educational field, and with regard to the level of education, a significant part of them teach in high schools and middle schools.

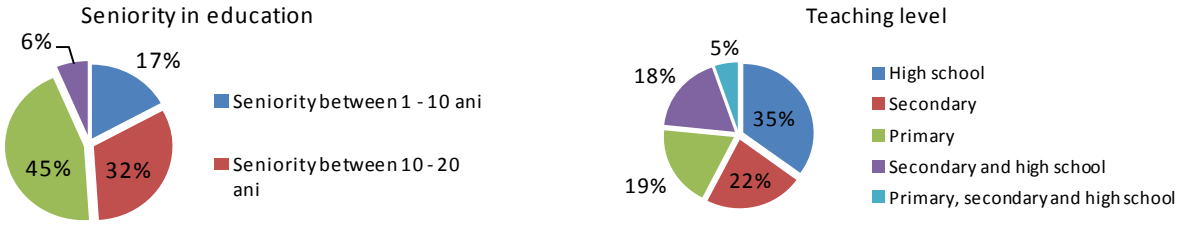

Figure 1. Profile of teachers according to seniority in education and teaching level (%)

A community garden generates an unconventional and non-formal space, which can host a series of activities, including teaching activities. According to the perception of the surveyed teachers, geography and biology are the main subjects that can be taught within a community garden, followed by drawing, counselling and professional guidance, music, foreign languages, sports, Romanian, history, religion, sociology, psychology, entrepreneurship education (Figure 2).

For example, plants can represent beautiful subjects to be drawn or painted, geography and history can be learned through short stories on the origin, the age of plants and their migration from one region to another, and skills in foreign languages or Romanian language can be developed by creating texts inspired by nature [27].

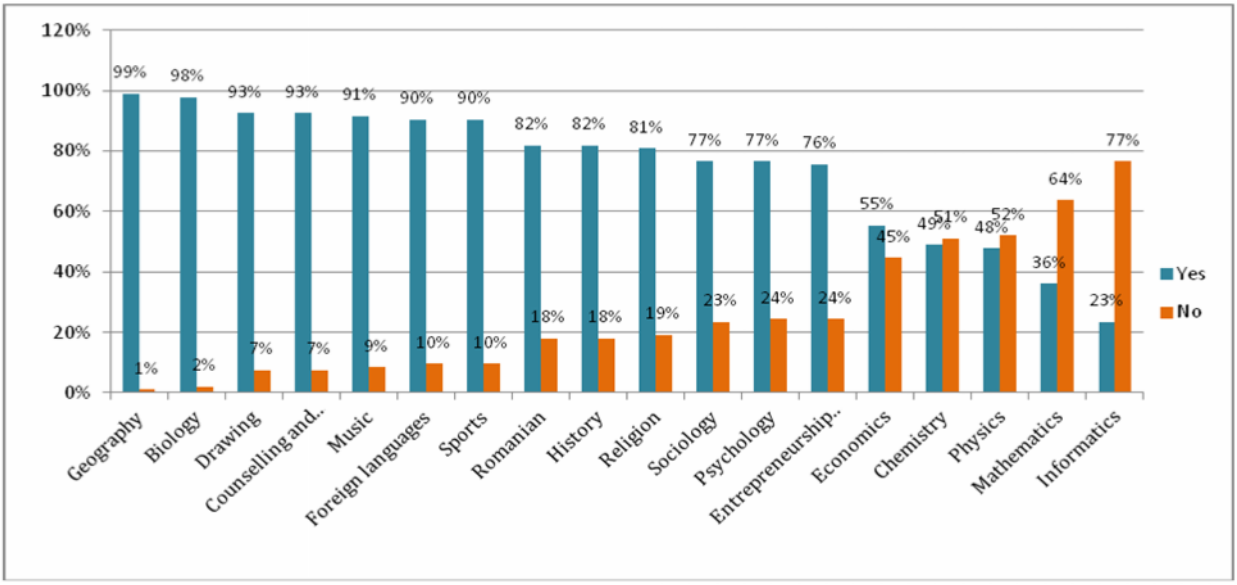

Figure 2. Subjects that can be taught in a community school garden, according to the teachers' perception

There have also been some subjects that, according to teachers' perception (Figure 2), cannot be taught in the unconventional space of the garden, such as informatics (77%) and mathematics (64%). Researches show that for mathematics practical classes can be carried out, for example by selling community garden products among students in a class [20], a concept that can also be implemented when it comes to the subject of economics, but also by determining the length, width, the area of the garden or the plants in the garden, by making use of geometry-related knowledge [27]. With regard to informatics, in order for the classes to be held in the community garden, equipment is needed, such as laptops for each student, but with the help of a video projector and only a laptop, in a shaded area, several introductory courses can be given.

If the subjects referred to were highlighted by the perception of the majority, the subjects physics and chemistry have a close percentage, 52-51% of the teachers considering that they cannot be taught, while 49-48% consider that they can be taught in the space of the community garden in school. We encounter a similar situation in terms of the subject of economics (Figure 2). Phenomena that occur in nature, such as photosynthesis, involving carbon dioxide and oxygen or the extraction of substances from plants, play an important role in teaching some subjects such as chemistry [7] and biology.

Outdoor teaching and learning activities, within the community garden, have multiple benefits both for students and teachers. Researches show that teachers are more enthusiastic about the subjects they teach [4], being even more relaxed [16], and students are more actively involved in the learning process, improving their social skills [17], but also their ability to focus [26].

An example of a programme, Multicultural School Gardens, was implemented in disadvantaged schools in Australia by an environmental education non-profit organization, the Gould League, and it was created to provide the framework for teaching and learning the core curriculum, to integrate students from various cultural backgrounds, but also to develop gardening skills. The programme led to a strong sense of belonging among students, to their good integration in the local community, but also to a better learning of English language [3].

The teachers' involvement is essential in the development of the community garden and in mediating the activities involving students, the surveys applied revealed the activities they would carry out with students in the community garden, but also what optional courses they would like to further develop.

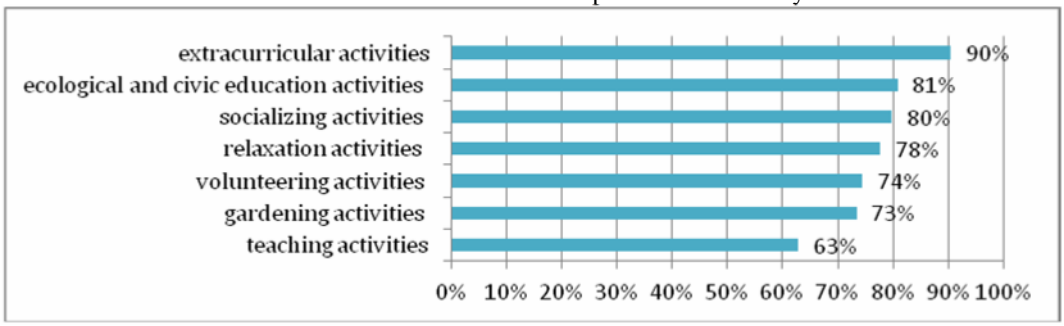

Figure 3. The main activities teachers would carry out with students in the school community garden

Although it was noted a positive attitude regarding the subjects that can be taught in the community garden space, however only 63% of the teachers consider that they can carry out teaching activities (Figure 3). This fact is justified by the curricula not adaptable to non-formal education, in unconventional spaces, which 79% of teachers consider to represent a barrier (Figure 7) in carrying out the activity in the school community garden space.

Despite the limited time, a resource that 65% of teachers consider a barrier in carrying out the activity in the school community garden space (Figure 7), 90% of them are willing to carry out extracurricular activities, but also ecological and civic education activities (81%), socializing activities (80%), relaxation activities (78%), volunteering activities (74%) and gardening activities (73%) (Figure 3).

Such activities can lead to a harmonious collaboration relationship between the teacher and the student, but also between the student and nature.

Outdoor activities, either learning or relaxing, give students the feeling of freedom, of escaping from the formal environment generated by the classroom, but also the opportunity to get involved and learn while playing [17].

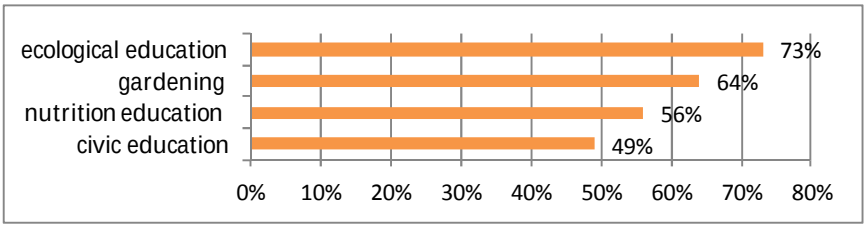

Figure 4. Optional courses the teachers would be develop in the context of the school community garden

Because within educational institutions it is allowed to create optional courses, in the context of a school community garden, 73% of them would develop an optional course of ecological education, 64% of them a gardening optional course, 56% an optional course of nutrition education and only 49% would carry out an optional civic education course.

These four elements, ecology, gardening, nutrition and civic education, are related and they contribute to the main goal of a community garden, that of improving people's quality of life by making them aware of the importance of nature in our lives, and by actively involving them in protecting the environment.

Of these results, the percentage of 49% regarding civic education is surprising. Civic education involves a broad concept, therefore we outline this concept around the community garden, because it involves developing respect toward nature. Teachers may associate civic education with concepts related to democracy, active citizenship and they may not associate the idea with environmental protection by making the students responsible in this direction.

With regard to gardening and nutrition education, researches indicate that students involved in growing fruits and vegetables in school gardens learn about nutrition, information that is relevant to growing food in the school garden [20].

Ecological education plays a vital role in the current context and it is necessary even from an early age, as we need generations prepared to cope with strong technologization, an alert lifestyle, in a polluted environment. Ecological education is necessary for them to understand the natural processes and their importance in our lives, and through the activities carried out in the community garden, due to the human-nature interaction, they will be able to acquire the necessary information.

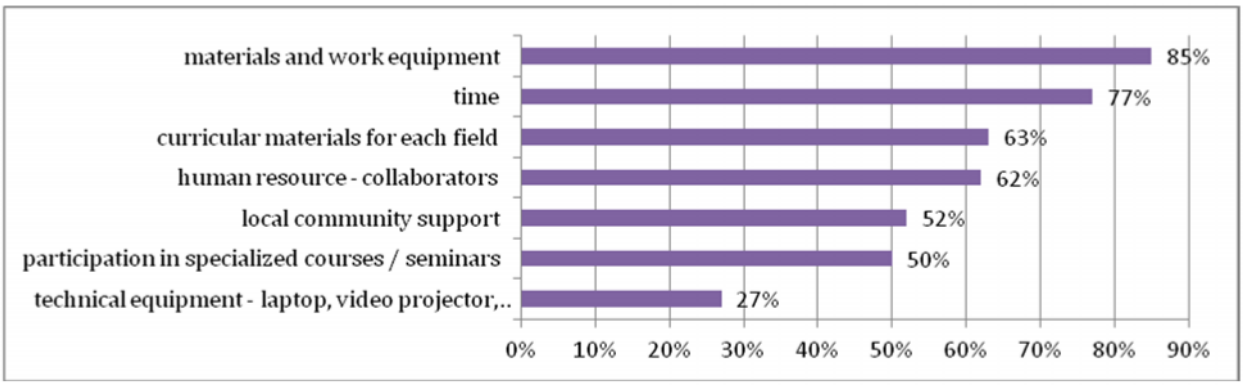

Figure 5. Resources that teachers consider necessary for implementing the optional courses

The development of these optional courses also require resources, therefore 85% of teachers consider that they need materials and work equipment, 77% of them need time, 63% need a curriculum for each field, 62% want collaborators (Figure 5).

The local community support is a resource required by 52% of teachers. 50% of them want to attend specialized courses or seminars, while only 27% consider that technical equipment is needed, such as laptop, video projector, projection screen, etc..

In this context we can identify an opportunity for collaboration between specialists in the field, horticulturists, landscapers, agronomists, biologists, etc. and teachers. It is also an opportunity for universities providing study programmes in this area, as they can offer curricular materials or can organize courses, seminars both for teachers and students, therefore generating the opportunity to promote the specializations of the profile faculties.

With regard to materials and work equipment, they can be obtained through sponsorships, with the help of non-profit organizations or the support of the local community, which also includes the role of parents. The specialty literature has emphasized the role of the parent and his/her involvement as a volunteer in developing the school community garden [10]. The parents' involvement in such a project is also beneficial for the school, but it particularly helps students understand the importance of education [6].

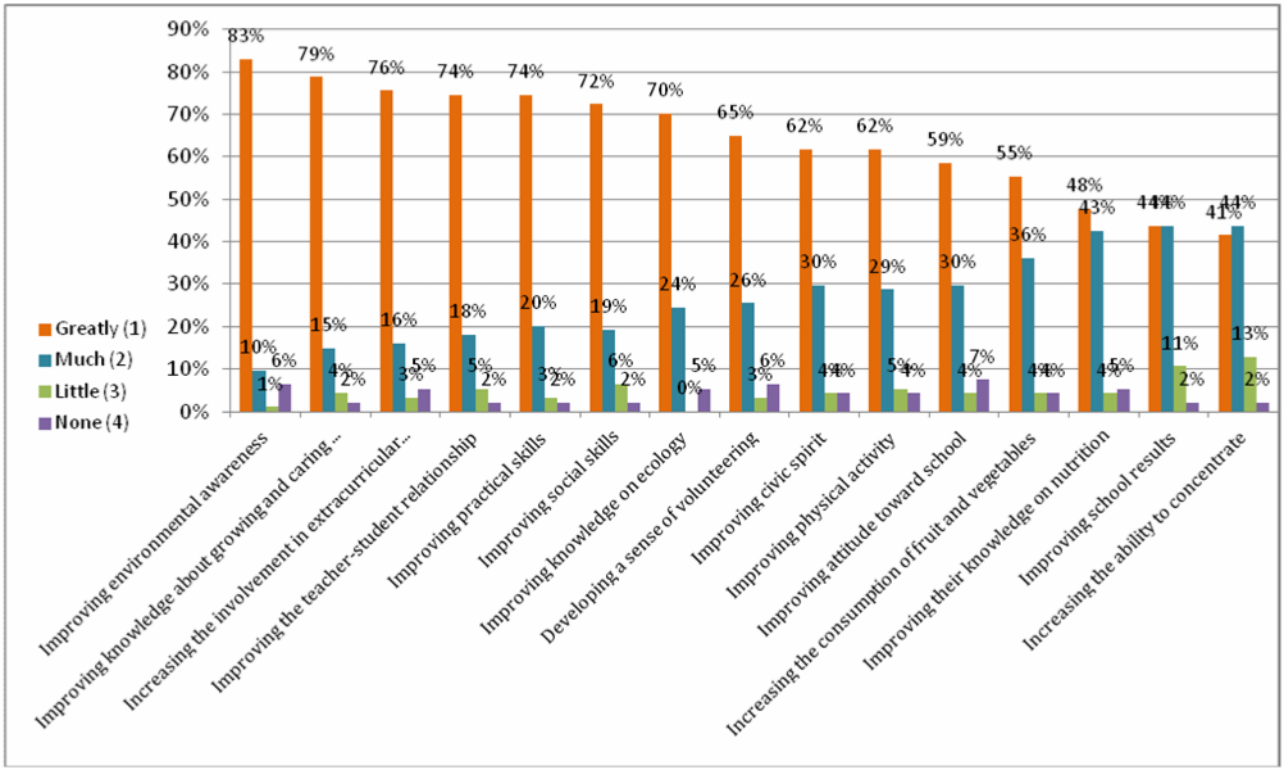

Figure 6. Teachers' perception on the influence of the school community garden on the students' behaviour and attitude

Considering the benefits generated by a community garden in school, teachers' perception regarding its influence on students' behaviour and attitudes has been a positive one (Figure 6).

Teachers consider that a community garden can have a great influence by improving environmental awareness (83%), improving knowledge about growing and caring for plants (79%), increasing the involvement in extracurricular activities (76%), improving practical skills (74%), improving the teacher-student relationship (74%), improving social skills (72%), but also by improving knowledge on ecology (70%).

Developing a sense of volunteering (65%), improving physical activity (62%), improving civic spirit (62%), improving attitude toward school (59%) and increasing the consumption of fruit and vegetables (55%) are other aspects of students' behaviour that teachers consider will be highly improved by the activities to be carried out in the community garden (Figure 6).

In smaller percentages, they believe that students can greatly (48%) and much (43%) improve their knowledge on nutrition. School results can be greatly (44%) and much (44%) improved, and increasing the ability to concentrate in class can also be much (44%) and greatly (41%) improved.

Only 1 to 7% of teachers believe that a community garden would have no influence on students' behaviour, while 1 to 13% of teachers believe

that it will have little influence on students' behaviour (Figure 6).

These results indicate the openness of teachers to the development of a community garden in school, but also the idea that teachers are aware that a school garden can represent a powerful tool for learning [18] and shaping future generations.

A community garden in school requires dedication, so it is important to find out the barriers that might prevent teachers from carrying out activities in the garden space. As aforementioned, the non-adaptable curriculum is considered to be a barrier, along with the limited time (65%), but also the lack of materials and work equipment (61%). Only 32% of teachers consider that they would not get the necessary support from the school administration (Figure 7).

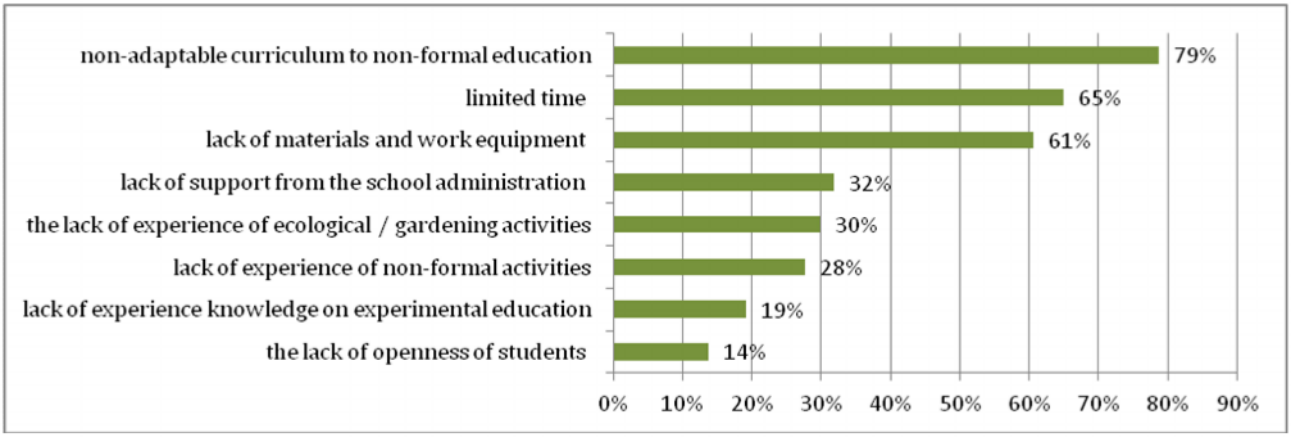

Figure 7. Possible barriers preventing teachers from carrying out activities in the community garden in school

A percentage of 30% of teachers consider a barrier the lack of experience of ecological / gardening activities, an aspect for which collaborations can be made with the specialists in the field or with faculties that have specializations in these fields.

In order to cover the lack of experience of non-formal activities (28%) and knowledge on experimental education (19%), it is possible to establish collaborations with non-profit associations. In a small percentage, only 14%, teachers consider a barrier the lack of openness of students to such activities.

Conclusions

Despite the fact that in Romania the concept of community garden in school is not yet developed, from the interpretation of the questionnaires we can note a positive attitude of teachers and a desire to get involved in the development of a school garden, but also to implement optional courses with a view to facilitate the human- nature relationships and to help raise awareness on the importance of protecting the environment in the context of an increasingly hectic daily life, which involves risks to both the physical and mental health of students, teachers and parents.

The teachers' needs for carrying out activities in the community garden are outlined based on the educational system and despite the curricula not adapted for education in unconventional spaces and limited time, teachers are willing to overcome the formal barrier of education. The need for courses and seminars on ecology, gardening, nutrition, but also on non-formal education methods is justified and necessary for a homogeneous and accurate transmission of information to students, but also for innovative practical activities meant to develop the appetite of students for environmental protection. A series of informative materials in the field of civic ecology are also mandatory, which can be done either in partnerships with non-profit organizations or with specialized faculties, thus facilitating the connection between the local community and the educational institution.

Breaking the barriers that can prevent teachers from carrying out activities will not be easy to achieve, but their answers indicate that they have the capacity for adaptability, therefore they will overcome such obstacles. The openness of teachers toward this concept represents an opportunity both for students and for the local community.

The analysis of teachers' perceptions shows a high degree of functionality in terms of creating and developing a community garden within the educational institution.

For a more harmonious and healthy development of both the individuals and the local environment, such concepts are highly needed. They shape an analytical thinking by becoming aware of the relationship with nature and developing a responsible behaviour, which will guide the individual in his/her everyday actions. The knowledge gained following such interactions will be multiplied due to the contact with other individuals, thus spreading a positive attitude and behaviour in terms of the importance of nature protection, which shall bring beneficial effects to communities.

References

1. Blair Dorothy - 2009 - The child in the garden: An evaluative review of the benefits of school gardening. The journal of environmental education, 40(2), 15-38.
2. Chawla Louise, Keena Kelly, Pevec Illène & Stanley Emily - 2014 - Green schoolyards as havens from stress and resources for resilience in childhood and adolescence. Health & place, 28, 1-13.
3. Cutter-Mackenzie Amy - 2009 - Multicultural School Gardens: Creating Engaging Garden Spaces in Learning about Language, Culture, and Environment. Canadian Journal of Environmental Education, 14(1), 122-135.
4. Dyment Janet - 2005 - Green school grounds as sites for outdoor learning: Barriers and opportunities. International Research in Geographical & Environmental Education, 14(1), 28-45.
5. Fleener A. W. - 2013 - Cultivating life: A study of a school landscape project (Doctoral dissertation), 14.
6. Giles H. C. - 1998 - Parent Engagement as a School Reform Strategy. ERIC/CUE Digest Number 135.
7. Gröger M. - 2013 - Teaching chemistry in near-natural learning environments to address sustainability. Strand 9 Environmental, health and outdoor science education, 158.
8. Guitart Daniela, Pickering Catherine & Byrne J. - 2012 - Past results and future directions in urban community gardens research. Urban forestry & urban greening, 11(4), 364-373.
9. Hartig T., Evans G. W., Jamner L. D., Davis D. S. & Gärling T. - 2003 - Tracking restoration in natural and urban field settings. Journal of environmental psychology, 23(2), 109-123.
10. Hazzard E. L., Moreno E., Beall D. L. & Zidenberg-Cherr S. - 2011 - Best practices models for implementing, sustaining, and using instructional school gardens in California. Journal of Nutrition Education and Behavior, 43(5), 409-413.
11. Krasny M. E. & Tidball K. G. - 2010 - Civic ecology: Linking social and ecological approaches in extension. Journal of Extension, 48(1), 1IAW1.
12. Krasny Marianne & Tidball K. G. - 2017 - Community gardens as contexts for science, stewardship, and civic action learning. Urban horticulture: ecology, landscape, and agriculture, 267.
13. Kuo F. E. & Faber Taylor A. - 2004 - A potential natural treatment for attention-deficit/hyperactivity disorder: evidence from a national study. American journal of public health, 94(9), 1580-1586.
14. Li Q. - 2010 - Effect of forest bathing trips on human immune function. Environmental health and preventive medicine, 15(1), 9-17.
15. Mayer-Smith Jolie, Bartosh Oksana & Peterat Linda - 2007 - Teaming children and elders to grow food and environmental consciousness. Applied Environmental Education and Communication, 6(1), 77-85.
16. Maynard Trisha & Waters Jane - 2007 - Learning in the outdoor environment: a missed opportunity?. Early years, 27(3), 255-265.
17. Marchant Emily, Todd Charlotte, Cooksey Roxanne, Dredge S., Jones H., Reynolds D., ... & Brophy S. - 2019 - Curriculum-based outdoor learning for children aged 9-11: A qualitative analysis of pupils' and teachers' views. PloS one, 14(5), e0212242.
18. Murakami T., Pharr J. & Bungum T. - 2016 - Educators' Perceptions Associated with School Garden Programs in Clark County, Nevada: Practices, Resources, Benefits and Barriers. Journal of Nutrition & Food Sciences. 06. 10.4172/2155-9600.1000465.
19. Nabhan G. P. & Trimble S. - 1994 - The geography of childhood: Why children need wild places. Beacon Press.
20. Ozer Emily J. - 2007 - The effects of school gardens on students and schools: Conceptualization and considerations for maximizing healthy development. Health Education & Behavior, 34(6), 846-863.
21. Ratcliffe Michelle M., Merrigan Kathleen A., Rogers Beatrice L. & Goldberg Jeanne P - 2011 - The effects of school garden experiences on middle school-aged students' knowledge, attitudes, and behaviors associated with vegetable consumption. Health promotion practice, 12(1), 36-43.
22. Robinson Carolyn W. & Zajicek Jayne M. - 2005 - Growing minds: The effects of a one-year school garden program on six constructs of life skills of elementary school children. HortTechnology, 15(3), 453-457.
23. Spilková Jana - 2017 - Producing space, cultivating community: the story of Prague s new community gardens. Agriculture and Human Values, 34(4), 887-897.
24. Trendov N. M. - 2018 - Comparative study on the motivations that drive urban community gardens in Central Eastern Europe. Annals of Agrarian Science, 16(1), 85-89.
25. Van Den Berg A. E., & Custers M. H. - 2011 - Gardening promotes neuroendocrine and affective restoration from stress. Journal of health psychology, 16(1), 3-11.
26. Wells Nancy M. - 2000 - At home with nature: Effects of "greenness" on children's cognitive functioning. Environment and behavior, 32(6), 775-795.

27. Waliczek Tina Marie & Zajicek Jayne M. - 2016 - Urban horticulture. CRC Press. United States, 36-44.
28. Williams D. R. & Dixon P. S. - 2013 - Impact of garden-based learning on academic outcomes in schools: Synthesis of research between 1990 and 2010. Review of Educational Research, 83(2), 211-235.