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Exploring educational traditions and experiences of block residents engaging in urban food self-production: a case study of Urban Living Lab

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Abstract

Food self-production offers a promising solution to many urbanization problems in cities. However, despite the advanced technology, the acceptance and involvement of local residents (its users) are required for implementation. The study presented here aims to gain a deeper understanding of the educational characteristics of future or current users of urban gardens, especially those oriented towards their own food production. The research will explore urban dwellers' traditional understanding and knowledge of the food growing process acquired over the course of their lives. We conducted in-depth interviews with residents of a selected block of flats in Łódź, who expressed their willingness to participate in an Urban Living Lab. As part of it, they would grow food for a year using hydroponic installation located in the corridors of their block. As a result of our analyses, we have identified the dominant traditions and social culture associated with growing food among the future participants of the Urban Living Lab, focusing primarily on the educational aspects. This is because we assume that effective educational interventions are an essential tool in the process of shaping the pro-environmental behaviour of city dwellers. The results obtained will be relevant for those involved in the urban education process, including city authorities, urban educators, pro-environmental associations, and grassroots activists.

Keywords Family education, Food education, Food growing pedagogy, Food growing traditions, Food self-production, Urban Living Lab

Introduction

The variability of human behaviour goes hand in hand with the globalization changes. The trend of mobility from rural areas to cities has been evident for many years causing overpopulation and urban sprawl. While 50 years ago urban residents accounted for 36.55% of the total population, today they account for 56.58% [1]. One of the main factors of this situation has been caused

by the agricultural revolution. Increasingly advanced technology used in agriculture is leading to a growth in agricultural productivity and a reduction in the need for workers. In turn, the development of the transportation system, as well as the technological and commercial revolution, have contributed to a rise in the attractiveness of cities, enticing more residents [2].

Urban sprawl, the reduction of available green space, and hectic and stressful lifestyles have caused a new trend to emerge for some time, the search for ways to increase contact with nature through the creation of individual or community urban gardening [3]. It is also increasingly being advocated to combine the social role of these

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gardens with urban agriculture. Indeed, the undoubted advantage of urban food self-production is not only to improve the wellbeing of city dwellers, quality of their life, but also to provide better access to fresh fruit and vegetables, while reducing the negative effects of urbanization [4]. However, the employment of such solutions depends on two parties, both the authorities implementing the relevant policies and the residents themselves, who will be willing to take such action. Understanding residents' needs, channels of effective communication and ways to reach them is therefore crucial in planning measures for sustainable urban development.

The main aim of this interdisciplinary research, from the borderline between pedagogy and agricultural science, is therefore to gain a deeper understanding of the educational characteristics of future or current users of urban gardens, especially those oriented towards their own food production. The research will explore urban dwellers' traditional understanding and knowledge of the food growing process acquired over the course of their lives. These objectives are expressed through the following research questions:

- RQ1: What are the farming experiences of urban dwellers who plan to engage in urban food self-production?
- RQ2: What educational activities have accompanied these experiences?

The originality of the study presented lies in the innovation of the project under which it is conducted. Understanding the background and perceptions of the local community is crucial to the designed social change for urban greening. Alternative food growing methods in urban areas remain uncommon, particularly in Poland, emphasising the significance of researching the diverse communities that participate in such endeavours. The presented study is a valuable contribution to understanding urban communities, of significant relevance to sociologists and peoples engaged in urban education.

In what follows, we review existing literature covering the issues identified in the research questions. Next, we present the research methodology undertaken. We then present the results of the research conducted. In the discussion, we compare the results obtained in this study with the effects of previous research. In conclusion, we highlight the key findings and suggest possible scenarios in various urban contexts.

Related works

Urban gardens are part of a trend that, on the one hand, provides a response to the social need to build the sustainable resilience of cities to environmental problems

[5] such as climate change, air pollution, food insecurity or limitation of existing natural areas, and on the other hand, supports a reaction to the individual, problematic, biopsychosocial human malfunctioning caused mainly by disconnection with nature [6, 7]. They involve gardening activities that could be perceived as a substitute for the authentic wilderness [8], especially in the era of a global pandemic, self-isolation, and social distancing [9, 10]. Moreover, except for the above-mentioned individual changes, the COVID-19 revealed large-scaled disruptions in the food supply chain causing food insecurity. Therefore, urban gardens seem to enhance the growth of local food production towards more resilient and sustainable food system. Throughout this all, it is not uncommon for local or central governments to attempt to initiate community gardens in order to increase the availability of diversified, local food and promote consumption based on local agricultural traditions [11].

Numerous studies have identified the indirect and direct personal, social, and environmental impact of urban gardening on human beings. Among personal factors, the literature indicates connectedness to nature as a human need [12], health benefits such as physical activity [13], obesity reduction [14], well-being [15, 16], and better mental health [13]. Social influence refers to the development of stronger neighbours' bonding and a sense of safety [17], whereas environmental impact focuses on profits associated with reducing pollution, improving soil, and providing biodiversity in the local ecosystem [18] as well as meeting the needs of sustainability [19, 20].

However, less literature has addressed the educational context of the urban gardening process. The reflection about the way how people gain knowledge and experience linked to their gardening skills, what educational activities have accompanied these experiences, or what role informal education plays in this process, is usually analysed to a small extent. Nevertheless, it may be stated that there are a few main gardening skills and knowledge sources. According to [21] gardeners usually refer to science-based books and botanical garden web pages, especially in the context of local ecosystem relations. [22] also add other mass media, such as radio, TV, and magazines. Some gardeners are actively involved in their gardening development by taking part in training courses [22]. Except for the above-mentioned sources, [23] mention that "the social surroundings of gardeners also play a role in the dissemination of knowledge. Advice given by friends, neighbours, and family can be a particularly important factor in choice of practices" [23]: 106]. Some researchers [22] include other gardeners to this group to provide transfer between knowledge and gardening skills. The above-mentioned study also reports that people

learn from their own personal observations and experiences. As [24] conclude, “the education that takes place in gardens can be a precursor to greater food advocacy and democratic engagement with the food system” [24]: 2] as well as may provide social cohesion [25].

Materials and methods

Study setting

The study was carried out as part of the initial phase of a project that aims to conduct a social experiment that contributes to improving the quality of life of urban residents, reducing climate change, and developing the cities of the future by creating an Urban Living Lab [26]. The main idea of the Lab is to create a space for growing fruits and vegetables in a hydroponic cabinets installed in a selected block of flats which will be cared for by a group of the block’s residents and to provide opportunities to develop relationships with neighbours. The experiment will last for one year. The aim of the experiment is not only to verify whether urban food self-production

will contribute to changing residents’ eating habits, reducing food waste, and reducing the carbon footprint through partial independence from the supply chain, but also to verify whether the Urban Living Lab will deal with COVID-19 consequences such as self-isolation and social distancing by strengthening and enhancing bonds of the dwellers community which makes this experiment unique. In its basic assumptions, the initial phase of the project means that hydroponic cultivation of plants provides the context for analysis of motivations, needs, attitudes, reflection and interest of urban dwellers in future activities based on food self-production.

The pilot process will be carried out among the selected residents of a block of flats located in Łódź (see Fig. 1), a city with county rights, belonging to Łódź Voivodeship, located in central Poland. The town was founded before 1332 and received city rights in 1423. The area of Łódź covers 293.3 km², with a population of 664,071 people, of which 54.4% are women and 45.6% men. After Warsaw, Cracow, and Wrocław, Łódź is the fourth city in Poland

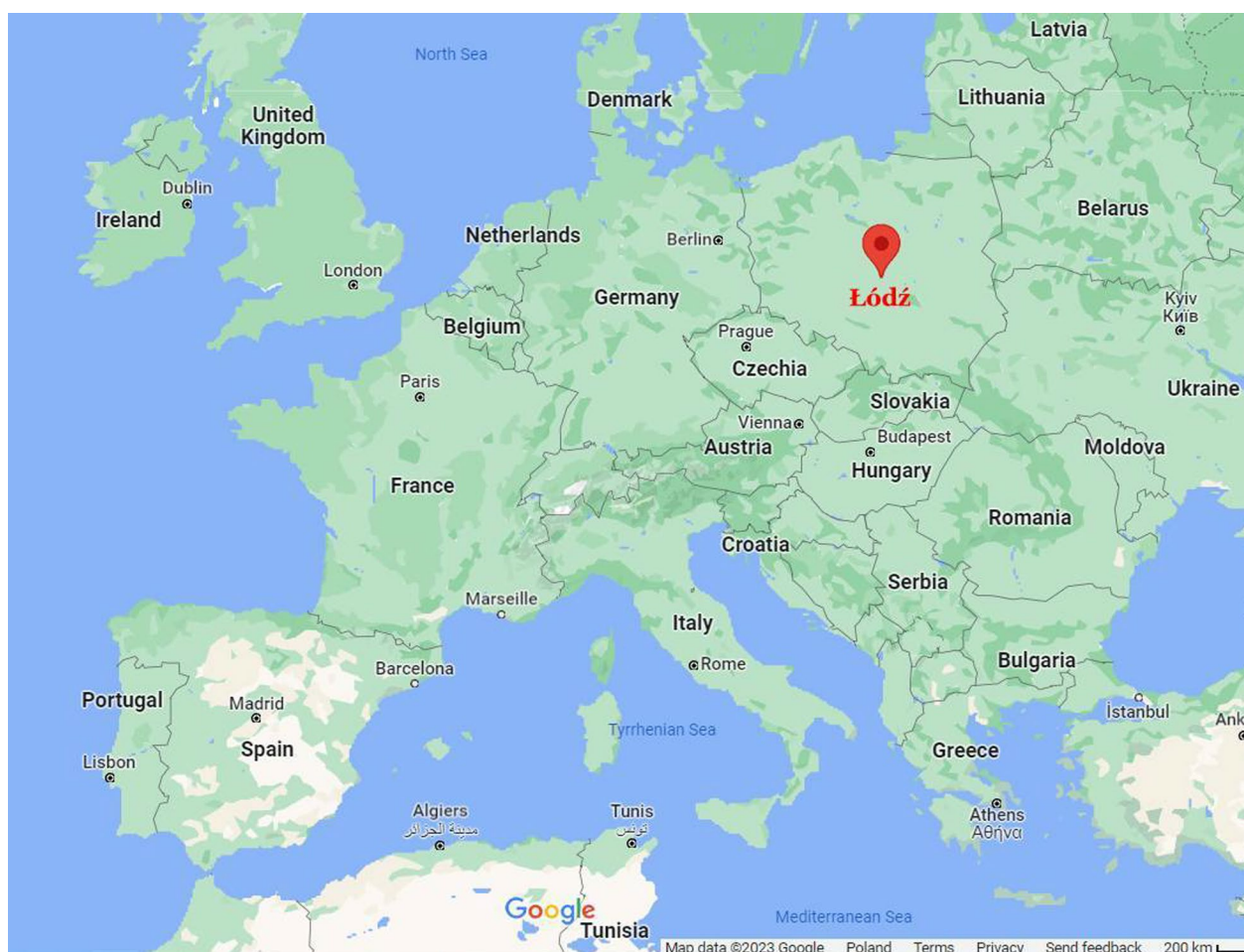


Fig. 1 Location of the study (Photo retrieved from <https://www.google.pl/maps>)

in terms of population. According to official data from Statistics Poland, the population of Łódź decreased by 15.4% between 2002 and 2021. The average age of residents is 45.7 years. It means that it is higher than the average age of residents in Poland as a whole, which is 42.2 years [27]. The selected residential block is located in the Łódź-Polesie district.

Data collection

Due to the pilot nature and limited funding, the project will install a maximum of twenty hydroponic cabinets in the corridors in one block of flats. Project participants are owners or tenants of twenty residential units who applied to participate in the project. It was planned to conduct individual in-depth interviews with them, so the research sample was selected as purposive. Due to difficulties in contacting individual residents related to unforeseen legal barriers to project implementation, fifteen individual interviews and two interviews with two residents at the same time were eventually conducted. The interviews were conducted in October–November 2022 and lasted between 1.5 and 2 h.

The survey questionnaire contained questions centered around four main topic areas: (1) background information, (2) social relations with neighbours, (3) motivation and personal perception of growing in hydroponic cabinets, (4) food waste. A total of 19 respondents ($M_{\text{age}}=39.4$, $SD=9.9$, Range 27–72) participated in the interviews, including 11 women ($M_{\text{age}}=40.5$, $SD=12.2$, Range 27–72) and 8 men ($M_{\text{age}}=37.9$, $SD=6.0$, Range 31–50). Two participants lived in the apartment alone, seven lived with a partner without children, eight lived with a partner and one child (including three with an adult child), and two lived with a partner and two children. The underage children were of preschool age ($M_{\text{age}}=3.1$, $SD=1.6$, Range 1.5–6).

All participants had university degrees, including one bachelor's degree, one engineering degree, 16 master's degrees, and one PhD degree. Two participants had education related to agriculture (biotechnology). The others represented such professions as medical biology, human resources (HR) specialist, entrepreneur, search engine optimization (SEO) analyst, technologist, service engineer, information technology (IT) application administrator, administration/finance, commerce, law, healthcare management, manufacturing engineer, public relations, physician (psychiatrist), IT specialist, manufacturing engineering management.

Data analysis

For logistical reasons, the interviews were conducted and recorded for transcription purposes via the Microsoft Teams application. MAXQDA Analytics Pro 2022

(Release 22.3.0) software was used for qualitative analysis. The analysis was conducted based on the original text in Polish (in which the interviews were conducted), and then the quotes were translated into English. A general inductive approach strategy [28] was used as the data analysis method, according to which coding was done on the basis of raw data. The premise for adopting this approach was the expectation that the results obtained would be the result of analysis of the raw data, rather than the researchers' top-down assumptions or theoretical models derived from the literature [28]. Although the first step of the analysis adopted five main areas corresponding to the individual research questions, the specific categories emerged within them were drawn from the dominant or emphasized phrases uttered by interview participants.

Results

Childhood food growing experience

Only two participants among those interviewed declared that they had no experience of food growing during their childhood. Their entire family, both parents and grandparents, had an urban background and did not have access to a plot of land where they could do farming. Property conditions also did not allow them for home cultivation. Other participants talked about their childhood food growing experiences, related either to living directly in agricultural areas, or holiday/weekend trips to their grandparents in the countryside, or to suburban plots their parents owned. The common denominator in most of these stories was the perception of agricultural work as a chore that was not associated with pleasant feelings. Many respondents emphasized that they did not draw their love to food growing from their family, as farming was not considered as a pleasure; it was more of a utilitarian behaviour. One respondent described her and her siblings' role at the time: *"we were more like deputies, yes, vegetable pickers"* (TG16: 65). Although helping with gardening work was considered a natural part of the reality of the time, it was most often recalled without enthusiasm, *"I remember weeding from garden work and the pain in my back. It was hard work. It cost everyone a lot of work to have these fruits and vegetables"* (TG15: 49).

Interview participants' statements reflecting their childhood experiences and the emotional colouring of these statements are summarised in Table 1.

Childhood education

Despite frequent participation in agricultural activities, in the opinions of respondents, childhood time was not associated with targeted education in this field *"Parents call to help then. You seem to know something, but there was not much interest. I didn't actually know anything"*

Table 1 Summary of childhood experiences from interviewee responses

Experience	Recalled with enthusiasm	Recalled neutrally	Recalled without enthusiasm
Urban background/No access to a plot of land			- Family in the countryside, unfortunately, I had neither on one side nor the other
Urban background/Holiday (weekend) trips to grandparents in the countryside	- I remember there were carrots that I would pull out of the ground, eat after washing - I remember the smell of freshly picked tomatoes	- It was the grandfather who was the thought leader	- Going to grandma's in the allotment was no longer attractive - I remember weeding from garden work and the pain in my back
Urban background/Holiday (week-end) trips to suburban plots their parents owned	- I had my own raised bed, I really enjoyed planting, weeding and always had such fun doing it - It's nice to go out into the garden and pick something of your own straight from the bush and eat it yourself	- The attachment to healthy food has always been there - It came out rather naturally	- It was on such a very utilitarian basis and not for pleasure - I didn't draw some kind of love for cultivation - There is always quite a lot of work to be done - I did not like it - Somehow I wasn't very interested in that - Then it turned out to cost a lot of work and my mother gave it up
Agricultural background	- Better composition than what is bought in the shop	- A bit of innate awareness - I was actively involved in the work in this garden - I can't say it was any such tradition, but there were conversations at home about it Today this tradition has died in that area - It was so natural that we had a vegetable	- I've never been a fan of that - It didn't make me feel satisfied - Why do I need it, after all, everything can be bought - My parents cultivated it and we as children helped - Unfortunately, with this acreage, this is troublesome - Despite the role models we have learned from home, we don't quite fit in - We were somehow not super enthusiastic about weeding beds - It was not a cool activity

about plants from such practice" (TG6: 55). On the one hand, the lack of interest in food growing issues resulted in children's reluctance to learn: "I know I've confused dill with parsley, which one is which, others I don't remember" (TG16: 65), or to downplay the value of the knowledge necessary to participate in farm work, "No, it wasn't so much to explain. You had to dig up a plot of land, which you did when you were older; sowing was no philosophy either, hole, seed, hole, seed. The same with potatoes, you had to do all sorts of cones and so on, so it was more of an observation than some great verbal lecture; it was a virtual learning" (TG8: 32).

On the other hand, it seemed that also the older generation was not eager to pass on knowledge, "because even when Grandpa had all the know-how, it didn't occur to him to tell us that the carrots had to be thinned, otherwise they would be so thin. And of course we didn't know, we didn't do it and we had thin carrots" (TG4: 18), "Perhaps they had some know-how (...). And I also don't know if they gave such information to their parents. I don't remember such things" (TG18: 48). According to respondents, this was because of the fact that for parents or grandparents growing food was a daily need or

routine, for others an interest, but passing on knowledge was not a priority. One respondent even remarked that, despite the fact that she went to a primary school, which was located in a rural area, no teacher came up with the idea of starting a garden at the school, as it appear to be popular nowadays, or visiting one. The respondent presumed the assumption of having food growing knowledge was obvious to everyone, as every local resident had access to a farm or a garden. Teachers, therefore, did not feel the need to educate children in this matter.

A different approach was indicated by one respondent whose family was involved in large-scale farming. His statements indicated a strong interest in agricultural topics acquired as a child. His grandparents were keen to share their knowledge not only with their children, but also with others, "cultivation was so well managed, (...) that during the war farmers were transported from the Reich for training on how to farm well" (TG9: 40).

Adulthood food growing experience

The period of adulthood, in the opinions of the respondents, became a time of changing attitudes towards plant cultivation, but the experiences gathered most often

depended on the resources available. Only one participant has no experience of growing food as an adult. Two participants grow herbs (mostly chives, parsley, mint, basil, cress for Easter) at home on a windowsill. Seven grow vegetables (mostly tomatoes, peppers) and herbs on a balcony or terrace. Two exploit the family allotment garden (in Polish 'Rodzinne Ogródki Działkowe, ROD'), two more use a small garden belonging to a flat in a block of flats, located on the ground floor, all four grow herbs or vegetables on the terrace at the same time. Five interviewees grow food on an allotment, either their own allotment located near or 200 km from Łódź, their parents' allotment, or one inherited from their parents and on a friend's allotment.

The most common reason for taking up gardening was to obtain herbs for use in preparing meals, as a form of hobby or escape from everyday problems. For those with access to their own garden, physical exercise was also significant. Respondents appreciated having a place where they can grow their favourite vegetables themselves. It gives them undisguised satisfaction. It is noteworthy that when addressing issues related to the experience of growing food, out of 19 respondents, 5 on their own initiative declared that they do not eat meat, even though the question about food preferences during the interview was not asked.

Adulthood education

Despite the interest in self-growing food in urban settings, this process is not accompanied by in-depth learning. Several participants declared that they had not sought more detailed information on the subject. On the one hand, this was due to the belief that growing vegetables on the balcony was easy, just limited to reading the instructions on the seed packet (usually, information on timing, planting depth, and distance between plants, presented graphically), *"if I'm honest, we weren't really trying to gain knowledge as it was growing. We saw that it was growing nicely. Maybe if it wasn't growing so nicely, we would have read something, tried something, but why should we hinder it works?"* (TG12: 62). Residents relied on their own experience. On the other hand, the image of the typical resident of this block of flats repeatedly emerged in the interviews as a very busy person, often working more than one full-time job, with no time for even basic domestic activities. In this situation, learning was not regarded as a primary need activity. In this context, ten participants identified the Internet as the primary source for seeking the necessary information about food growing, providing quick and easy access to it, *"It knocks on the internet and it's there straight away"* (TG6: 56). One of these participants, indicated that she is a member of a Facebook group where people upload a

photo of a diseased plant and ask others about the possible causes. None of the interview participants had used an mobile application to support urban food growing.

Other sources of knowledge were mentioned in the interviews. One person used books at a time when the Internet was not easily accessible. Four other participants also mentioned using books, but to a very limited extent, *"I even bought a book on growing in a block of flats, yes. Urban gardening—something like that, that kind of green with big carrots. Of course. I didn't read the whole book, just what interested me the most"* (TG16: 69). According to four participants, friends who successfully grow their own plants are a more reliable source of knowledge than the Internet, for one person it is gardeners selling cuttings, for another four it is immediate family, *"Here I will admit that I take the easiest way, I just call my mother or grandmother, because they are the people who have been doing it for x years"* (TG2: 69).

Two interviewees watch TV programs about gardening. However, they indicated that the main purpose is not to learn about growing fruit and vegetables, but the aesthetic aspects. In their opinion, programs such as 'Maja in the Garden' (in Polish 'Maja w ogrodzie') are enjoyable to watch and serves an inspiration for planning one's own garden.

Discussion

The vast majority of the block's residents who expressed an intention to participate in an Urban Living Lab aimed at food self-production had some experience of growing food from their childhood. Their understanding of growing food stems from the experience of traditional farming activities carried out by the family, on a small or large scale. Informal learning was the main source of knowledge about the food production process. The perceived potential for informal learning, particularly intergenerational learning, is being attempted in newly established school-based community gardens called 'Community Food Hubs', where the traditions and culture of food production and consumption are transferred to the next generation in the form of play [29].

Our findings indicate that interviewees' attitudes towards gardening have evolved over the years. While in childhood it stemmed from a sense of duty, in adulthood it was linked to interest, one's own initiative to undertake gardening activities. Although the occurrence of negative emotions towards agricultural work done in childhood is indicated by other researchers [30], the results of the conducted study do not confirm the educational effects of these activities. According to the interview participants, childhood was not a time of effective food growing education for them. This was due both to a lack of interest in agricultural issues on the part of the children themselves

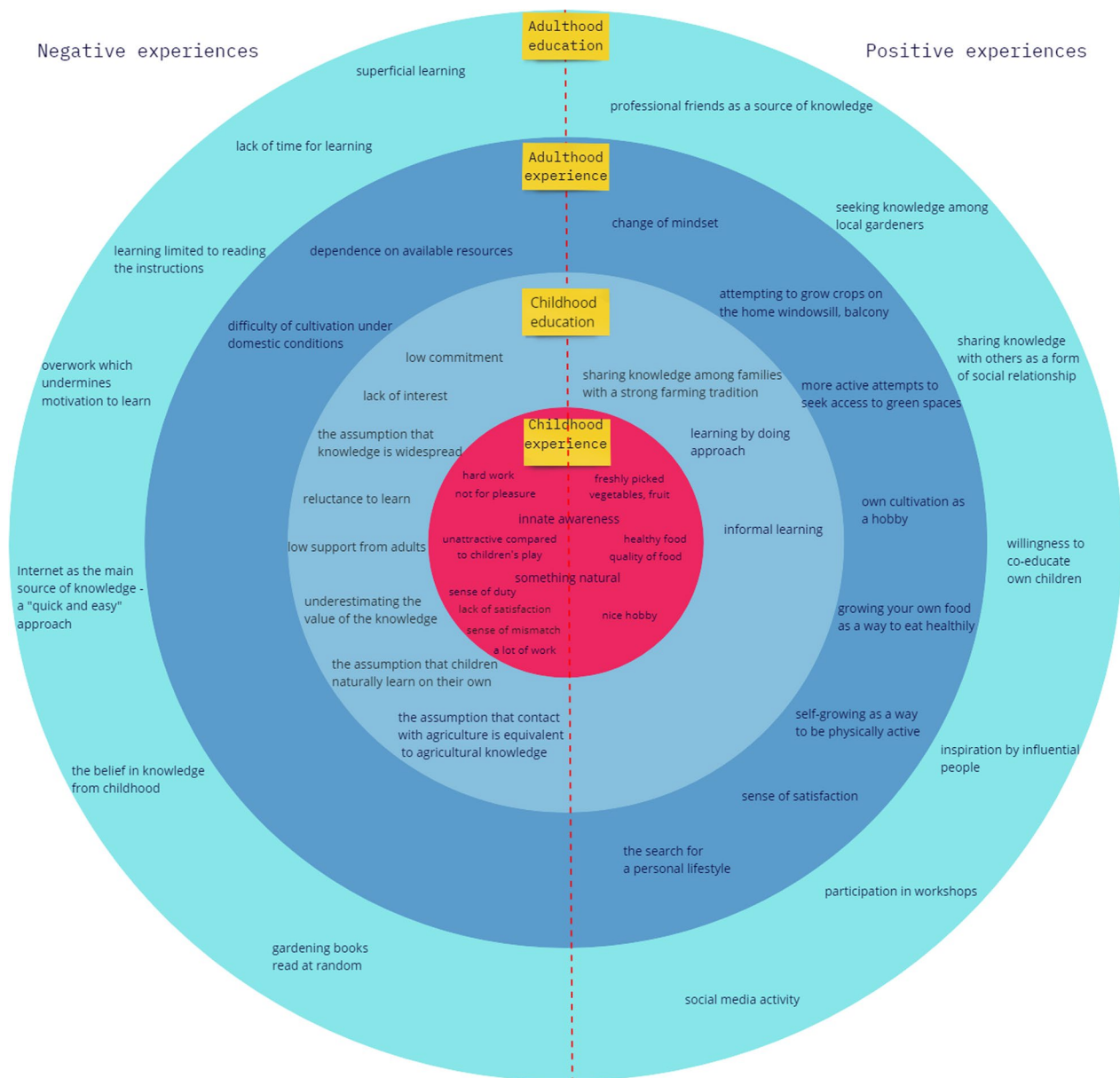


Fig. 2 A silhouette of a potential Urban Living Lab participant formed from the overlapping layers of his or her life experiences related to growing food. Author's own elaboration

and a lack of initiative in this direction on the part of the adults, whether parents, grandparents or teachers. It is advisable to strengthen the requirement for intergenerational knowledge transfer, as research indicates its significant potential [31].

Although the knowledge acquired in childhood was not perceived as deep, expert knowledge, it was nevertheless, in interviewees' opinion, sufficient to undertake small-scale urban gardening. The exception to this was families with a very high agricultural profile. Their interest in growing food and intentional family learning rated

highly, and as other studies show, the learning process then takes place in a master-student relationship [23].

Despite a change in attitudes towards gardening and even a change in life priorities expressed by a desire to escape from the city, insufficient education has an impact on adult functioning in urban spaces. Just as for those with access to an allotment the accumulated knowledge seems sufficient to derive satisfaction from gardening [21] for those limited to having a balcony or terrace, the effects of food growing often left them feeling unfulfilled. Our research shows that the residents of the block were

repeatedly confronted with a lack of expected results from their work. On the one hand, the feeling that they possessed basic gardening knowledge from experience, on the other hand, the lack of time due to excessive work obligations meant that superficial information searched on the Internet was not sufficient about achieving high yields from their own crops. The prospect of having a hydroponic crop was seen in this aspect as a chance to finally make their gardening efforts a success, as some of the work will be done automatically.

Based on the objective evidence and findings from the survey, we have designed a silhouette of a potential participant in the forthcoming Urban Living Lab experiment. It is formed from overlapping layers of life experiences related to food growing, both those that the participants perceive as positive and those that they describe unenthusiastically (Fig. 2). It is worth considering it as a valuable starting point for the conceptualization of educational interventions for the development of urban gardening.

We believe that the contact with nature interviewees experienced in childhood, through the opportunity to grow food for own consumption purposes, resonated with the need to create opportunities for their own children to have similar experiences. Vegetables such as tomatoes and peppers, fruits such as raspberries and blackberries, and herbs grown in urban gardens were not only a source of satisfaction, but also influenced the food culture of the whole family and instilling it to the next generation. Although these activities have been very difficult in the conditions of a block of flats, where growing on a windowsill or balcony has often been more or less unsuccessful, it is important that attempts are made. Furthermore, a significant change in attitude towards gardening appeared during Covid-19 lockdowns that revealed a need for nature, own food, and social interactions which motivated people to take part in the Urban Living Lab project. This means that despite the easy availability of vegetables in the shops, the tradition of growing food is an important part of life, including social life, for the city's residents. Additionally, the opportunity to grow one's own food can increase access to urban greenery and at the same time strengthen the human-nature bond, encouraging more frequent visits to green spaces such as parks, agricultural areas and gardens [32].

Conclusion

The main contribution of the study is to deepen knowledge of the transformative processes involved in moving from rural to urban conditions, in particular the traditional understanding and knowledge of the food production process acquired over the course of people's lives.

The necessity of actions aimed at shaping pro-environmental behaviour of city dwellers and creating climate-resilient cities is indispensable. However, in order to be effective, knowledge about the recipients of these activities is necessary. The novelty of the study is related not only to the uniqueness of the planned intervention, based on the implementation of hydroponic food growing in the corridors of blocks of flats, but to the cognition of the food traditions and cultures of the target group—inhabitants whose educational needs are changing under the influence of living place, technological progress and changes occurring due to pandemics. The results obtained will be crucial not only for the project team, but also for those involved in the process of urban education, city authorities, urban educators, environmental associations, grassroots activists.

The limitation of the research refers to the sampling. Due to project needs, the interviews were conducted among residents who volunteered to participate in the project co-led by the authors. In addition, the qualitative nature of the study implies that it is not possible to make any generalizations. Due to volume limitations, the study also does not cover all the issues raised in the in-depth interviews conducted. It will therefore form part of a series of publications dedicated to understanding the characteristics and needs of current urban residents.

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Author contributions

Conceptualization: ED; Data curation: ED, AKS; Formal analysis: ED; Funding acquisition: ED; Investigation: ED; Methodology: ED; Project/research administration: ED; Writing—original draft ED, AKS; Writing—review & editing: ED, AKS.

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Availability of data and materials

The raw data which were the basis for analysis will be made available from the corresponding author (ED), upon the request.

Declarations

Ethics approval and consent to participate

Research was conducted in accordance with the principles embodied in the Declaration of Helsinki, in accordance with local statutory requirements, and with the approval of the external experts committee evaluating the proposal and monitoring the SmartFood project's ongoing progress. The current study is based on part of the material collected during the in-depth interviews conducted. The participants (previously registered in the SmartFood project) provided implied informed consent before the data collection. They were initially informed about the purpose of the interview and received a general remuneration—about 22 Euro per month for taking part in project activities.

Consent for publication

All authors declare consent to the publication of this article.

Competing interests

The authors declare no conflict of interest.

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