Lifelong Education: Citizenship Lessons for Life in More Sustainable Communities?

Adriana Gelpi, Rosa Maria Locatelli Kalil and Wagner Mazetto de Oliveira

Abstract The objective of this paper is to present participatory research on urban planning, sustainability, and education for citizenship. The study is justified by the urgent need to develop actions to promote the relationship between undergraduate and graduate courses to improve the quality of primary education. The study aims to integrate, implement, and communicate urban planning and sustainability concepts in the community. It includes primary school students and teachers as well as university researchers (academics), and through interdisciplinary integration, contributes to improving the education process. To develop this research, partner schools were selected based on their location in the urban fabric and physical, social, and territorial conditions. The research was implemented in two stages. The first stage was conducted in the school and university offices, and the second involved a field survey to identify routes in the city and around the university. The results of this research increased the awareness of the community of citizenship and the right to the city, as well as their knowledge of urban planning, sustainability concepts, and critical thinking on the process of urban development. Community living increased the academics' awareness of the real needs an urban project should address. Furthermore, the primary school students were able to develop a critical outlook of the urban space they live in, and then contribute to sustainability and citizenship.

Keywords Participatory research · Urban planning · Education for citizenship Sustainability · University-primary education integration

A. Gelpi · R. M. L. Kalil (✉) · W. M. de Oliveira
Faculty of Engineering and Architecture, University of Passo Fundo,
BR-285 Road km 292, 99052-900 Passo Fundo, Brazil
e-mail: kalil@upf.br

A. Gelpi
e-mail: agelpi@upf.br

W. M. de Oliveira
e-mail: wagnermazetto@gmail.com

1 Introduction

According to a report by the Coordination for the Improvement of Higher Education Personnel (Capes) (Brasil 2010), the scientific development of the last decades has influenced important themes for humanity such as environmental preservation, increased food resources, advances in medicine, urban sustainability and mobility, media socialisation, and improved quality of life.

However, the report emphasises that development, which benefits people's quality of life, must be monitored to ensure objective improvement and larger social influence in its employment. This implies a new contract between science and society to ensure that scientific progress solves problems that influence humanity and includes all segments of the population.

In Brazil, despite numerous scientific and technological advances, these have not been transformed into knowledge socialisation. As such, at the beginning of the third millennium, the Brazilians' low level of education has been confirmed. Therefore, it is concluded that the technical knowledge developed by the scientific community has not benefited much of the community. This lack of knowledge prevents further advances in scientific development.

Studies by Capes in Brasil (2010) address the implementation of actions to provide post-graduate programs to improve primary education to ensure interdisciplinary integration of these institutions. This is based on the belief that the concern of higher education institutions such as the National System of Post-Graduation might significantly contribute to the country's quality of education.

However, beyond education—and consequent to its low relevance—in the 21st century in Brazil, few people have achieved the right to the city and to built sustainable spaces as well as to life characterised by urban quality. Maricato (2001) states that access to housing spaces is limited in cities, adding that not enough social policies meet the needs of most of the population. In this scenario, alternatives such as illegal or informal housing are all that usually remain for the low-income community.

In more recent work, namely 'The impasse of urban policies in Brazil' (Maricato 2011), the author approaches the concern leading us to the purpose of this work, namely that the construction of a new paradigm of education and its reflection in cities demands a cultural change. She says that to fight *urban illiteracy* (2011, p. 45), a pedagogical campaign addressed to civil service employees; social, professional, and academic students; and union leaders such as students, journalists, and intellectuals is necessary.

Maricato asserts that 'knowing the reality of Brazilian cities and the specific reality of each city requires the incorporation of a theme as a school subject in the fundamental school' (2011, p. 45). In this context, the objective of this work—first as a research issue—is the challenge of diffusing the concepts of urban sustainability and planning for the community among students and teachers in the public primary education system and at the University of Passo Fundo (UPF) to contribute to the process of educational qualification through interdisciplinary integration.

2 Justification

The chapter, *Primary Education: a new challenge for the SNPG*, the National Plan of Post-Graduation (PNPG) in Brasil (2010, p. 157), states that the scientific development of the last decades must create a new relationship between science and society. It continues that this 'can only exist if all citizens own scientific development and a culture that allows them to understand and administer their everyday lives to face and integrate themselves critically and autonomously in this life. Nowadays, the use of citizenship requires knowledge of science and the methodologies scientists use in their research'.

The text elaborates that the challenge is composed of two axes: improving the scientific base to follow scientific developments and making this knowledge available to all Brazilians, primarily children and youngsters (Brasil 2010, p. 157). This explains the urgent need to develop special actions that provide post-graduate articulation by improving the quality of primary education. This issue will be important in helping overcome the challenges of National Education in the next decade in terms of education qualifications and the initial and continuing development of professors. Several programs support this ideal, including Capes' National Program of Teacher Formation (PARFOR) and the Program of Scholarships for the Introduction to Teaching (PIBID).

When aiming to advance learning efficiency and guarantee the right to learn, schools must develop activities that articulate with students' reality to enhance local culture and the use of citizenship at different stages of development. To cope with this diversity, teachers must develop a pedagogical framework with students to motivate them to stay in school and new pedagogical practices to which post-graduate programs can contribute (Brasil 2010).

The relationship between high and primary education has been proposed as a factor that qualifies teaching at all levels. Besides the right to education, established by the Federal Constitution of 1988 and implemented by the Law of Guidelines of the Brazilian Educational System in 1996, this concern is highlighted in normative documents such as the PNPG 2011–2020 and National Plan of Education.

Regarding the post-graduate area Engineering I, in which includes the UPF's Graduate Program in Civil and Environmental Engineering, 'interaction with the fundamental school and high school' (Brasil 2013) can be improved by the activities proposed in this research, which includes researchers and students of the university and professors and students currently in the fundamental teaching phase.

The concentration of the Master's degree in Infrastructure and Environment at UPF considers the theme of urbanisation and sustainability, focusing on territorial planning and the management of infrastructure. This line of research 'approaches themes related to comprehending the territory occupation process and the planning, management, and projects of its infrastructure and environment to qualify the relationship between the natural and built environment from the perspectives of sustainable development and the population's quality of life' (UPF 2014).

The relationship between science and society will only exist if citizens own scientific development and culture, which allows them to understand and administer their everyday lives and make decisions based on their own knowledge. As such, citizenship demands scientific knowledge. However, this suggests challenges. On one hand, we must increase the scientific base to follow worldwide development. On the other, this knowledge must be made available to all Brazilian citizens.

Integrating the challenges of this proposed planning, education, and citizenship, Volkmer (2005) observes that studies on the transversal themes and discussions on curricular programs in schools may enhance knowledge, heritage, and the use of citizenship. These prerogatives, implemented by the MEC, invite the introduction of interesting discussions on the built patrimony.

Regarding cities and the built space, Soares (2005) refers to educational experiences, the objective of which is to encourage a critical position in communities as well as reflection and thinking on cultural heritage. Teaching activities and research must elucidate concepts to increase people's awareness of the importance of heritage to the social memory of generations, without exclusion and discrimination. To understand oneself as a citizen, it is necessary to understand and respect the surrounding space and establish social, regional, and world differences, considering the time and set of representations.

Maricato (2011, p. 45) notes that Brazilians' significant and generalised ignorance of their geographical space makes knowing the reality of the set of cities in the country urgent. She adds, 'it would be feasible to eradicate or at least minimise urban illiteracy, the alienation related to urban space, and the strengths that control it, and create a new culture and new level of knowledge of the cities of Brazil, disseminating proposals created by movements of urban reforms'.

In this sense, the proposal of a research project on urban planning and sustainability, and its materialisation in the area is justified. It integrates and increases the awareness of students in primary education schools of development work. The issues addressed will contribute to understanding the organisation of urban space to enhance these spaces and implement the maintenance of biodiversity and citizenship principles.

3 Objectives

According to Public Notice 03/2014 of the Foundation of Support to Research in the State of Rio Grande do Sul (Fapergs) and Capes, in accordance with the Program of Introduction to Sciences, Mathematics, Engineering, Creative Technologies, and Letters (PICMEL), which encourages a scientific vocation for young students in public fundamental and high schools in Rio Grande do Sul, the research reported here improves the activities reported and published in a study entitled 'Medium cities, planning, and sustainability: The case of Passo Fundo/RS'. This research was achieved with the support of Fapergs in 2012/2013.

At this stage, the proposal included students, professors, and public fundamental schools in Passo Fundo in a study focused on the fields of Engineering and Social Sciences. This involved communities located in peripheral and low-income areas of the city in activities initiated by the Graduate Program in Civil and Environmental Engineering, with a concentration in Infrastructure and Environment in the Civil Engineering program. Furthermore, activities were also performed by the Urban and Regional Studies Laboratory (Laburb) of the Architecture and Urbanism Undergraduate program at UPF. As such, the objectives were as follows:

- To establish research and activities integrated between UPF and fundamental schools in Passo Fundo to approach issues related to the city, urban planning, sustainability, and citizenship.
- To present and analyse the planning of territorial organisation proposed by the Master Plan of Integrated Development of Passo Fundo (PDDI) (Passo Fundo 2006) to the city and urban guidelines for areas to be researched (neighbourhoods with schools) according to the proposed methodology.
- To verify if the planning guidelines identified for the study areas represent aspects of urban sustainability.

4   Review of the Literature

In terms of school levels, the Law and Guidelines of the Brazilian Educational System (LDB) (Brasil 1996) states that the purpose of primary education is to develop the student for the use of citizenship. For higher education, among other objectives, the LDB focuses on cultural creation, scientific development, and reflexive thinking, encouraging research and investigation. The aim in higher education is to develop technology, create culture, and promote the publishing of cultural, scientific, and technical knowledge.

However, despite these broad objectives, the PNPG (Brasil 2010) addresses the low performance of primary education students, considering that there is no satisfactory use of the teaching and learning process. This demonstrates the need to consider Brazilian education as a whole in a systemic not sectioned manner, which is the current approach. As such, the PNPG encourages post-graduate programs to focus on societal demands, especially in primary education, promoting significant learning from the perspective of social demands and individual development in an integrated way.

Interpreting the expressed right to education is a way to initiate this debate, as defined in article 205 of the Federal Constitution. This right can be understood as going beyond access to school and means the right to learn. To ensure that this right is guaranteed, it is necessary to provide inputs and develop attitudes that can promote more effective learning. This might cause people to reconsider the educational system (Brasil 2010).

In this context, Capes (Brasil 2010) proposes that graduate programs contribute to improving the quality of education by implementing learning that addresses social demands and individual development to meet the needs of Brazilian students, who demonstrate different abilities and interests. This is to ensure their right to education by considering the pluralism of ideas and pedagogical concepts.

Improving the quality of primary education is a great challenge that must be strategically addressed to ensure the economic and social development of the country. For Capes (Brasil 2010), program development is organised by multidisciplinary teams, making the involvement of graduate courses feasible in terms of widening debates. By limiting programs only in education, it is hoped that the participation of various fields will bring new ideas to the system, which can help to identify alternative pathways to improve the quality of primary education.

It is understood that schools must develop activities that articulate with students' reality to enhance local culture and the use of citizenship. However, identified difficulties include ensuring the permanence of youngsters in school and low levels of learning. These difficulties indicate that high school, as a stage of primary education, is currently characterised by inadequate pedagogical procedures. The quality of information created and used every day and the presence of technology in students' lives constantly puts into question the information professors bring to the classroom, showing the urgent need to change current procedures (Brasil 2010).

Therefore, facing new challenges such as establishing innovative experiences and avoiding monotony inside the classroom are difficult achievements. Thus, these trans-disciplinary experiences such as those at the theatre, museum, outdoors, or downtown, among others, still face strong barriers in the academy. Perhaps these barriers stem from the technical teaching established throughout compulsory history, where issues relating to the constitution of practices that can make people think and act in a critical and pleasant manner were left behind.

On the other hand, integrating educational experiences to encourage critical and reflective thinking alongside the community stimulates thinking about passive or careless attitudes towards living, study, and work spaces. The cultural and built heritage as an object of dynamic academic activities can be a pathway and contribute to the development of more critical attitudes and increased awareness, thus enhancing the preservation of cities and the construction of citizenship.

Volkmer (2005) maintains that the achievement of activities now proposed by Capes (Brasil 2010), namely integrating the research of the academy with the community, may allow a dialogue between research, education, and citizenship, turning cultural heritage into an important integrating element. The author observes that the dialogue between the university and community, utilising the city as an enabling element of interaction, is an interesting strategy. In other words, the urban planning and sustainability approach might be a challenge in the production of socially relevant scientific knowledge.

The experience of some education institutions regarding work with communities shows that it is possible to significantly improve the quality of education by developing good practices appropriate to the school community. There are different pathways through which to develop education high in social quality, although this

means that the school community must be committed to the development of a shared and democratic educational project. In this sense, the development of special actions that promote the relationship between graduate courses and the improvement of primary education through interacting with professionals in continuing education is demanding.

5 Research Methodology

This research approaches urbanism and sustainability as pathways to education and citizenship. The study was conducted in 2014–2015, and included students and teachers from two primary education public schools, namely Escola Municipal de Ensino Fundamental Guaracy Barroso Marinho in the José Alexandre Zácchia neighbourhood and Escola Municipal de Ensino Fundamental Jardim América in a neighborhood of the same name, located in the urban periphery (Fig. 1).

As a study case, guidelines that address the PDDI (Passo Fundo 2006) were verified and selected for this research, and implemented in the study areas considering the principles of sustainability. An initial challenge was integrating, employing, and publishing the concepts of urban sustainability and planning in the community with the primary education students and teachers of Passo Fundo. Through interdisciplinary integration, the aim was to contribute to the quality of the educational process.

As the next step, it was proposed to recognise, analyse, and interpret the city's urban expansion before planning under the aegis and guidelines of sustainability provided by the Statute of Cities (Brasil 2001) and proposed in the PDDI. This included increasing young students' awareness of urban, environmental, and citizenship issues. The theme of this work was participative research on urban planning, sustainability, and education for citizenship. This is justified by the urgent need to develop special actions that promote the relationship between graduate and post-graduate programs by improving the quality of primary education.

Fig. 1 Location of the schools and neighbourhoods that participated in this research. *Source* The authors: based on Google Maps (2016)

The main objective of the research was to include students, teachers, and public schools in a study focused on the fields of Engineering and Applied Social Sciences, while involving communities located in peripheral and low-income areas of Passo Fundo. Through this research, it was possible to integrate the Post-Graduate Program in Infrastructure and Environment, the Laboratory of Urban and Regional Studies, and the Architecture and Urbanism course at UPF. Other objectives included the presentation and analysis of territorial organisation planning proposed by the PDDI of Passo Fundo (2006) to the city and the researched areas. As another objective, it was verified whether the planning guidelines identified in the study area included aspects pertaining to urban sustainability.

Specific objectives were to employ, elucidate, publish, and research issues related to the city, urban planning, and sustainability. To analyse the PDDI guidelines for Passo Fundo city and the selected areas, topics related to the territorial organisation, constructive indexes, and aspects of urban sustainability were identified. The field research aimed to map and graphically and digitally record the local urban landscape, document areas at risk, and determine the potential for the sustainable development of these areas.

Considering the city as an ecosystem, Agyeman (2003, p. 452) understands that 'urban ecosystem education must become part of a large and lasting process of learning that helps people predict and define what communities and cities are sustainable within the short and long term'.

The methodology adopted the concept of citizen science, which was developed by Irvin and Agyeman (Agyeman 2003, p. 457) as a component of moving towards sustainable communities and a long-term objective. This approach to science and expertise offers at least the potential for dialogue between scientific and citizen groups.

The population's participation takes time, and can be of several modalities. For example, Agyeman (2003, p. 457–462) describes the activities of students in Detroit, who addressed problems in their residential areas (crime, drugs, pollution, precarious houses, and others). Furthermore, the author discusses the activities of Asian women in Bradford in the United Kingdom, who grew vegetable gardens comprising a mix of Bangladeshi and British plants. The author concluded that to help people build, transform, create, and emancipate their world for communities and sustainable cities, they must begin in their current locale. Participative research agendas, where the professor (researcher) is a co-learner and the learner is the co-researcher, develops a strong learning pedagogy for professors, researchers, and others involved in education on urban ecosystems to develop communities and sustainable cities.

As the study refers to an approach to cities for people, the research was based on the approach by Harrison and Burguess (2003, p. ix), in which the relevant educational tools must consider: (1) the complexity of the cities; (2) the dynamic nature of the cities as places where change is the norm and directed by multiple interacting forces and conditions; (3) the vital role performed by special relationships, human and other disturbances, and historic influences in the urban environment.

In terms of the urban space analysis, the readability concept of Lynch (1997) was considered. In a study on the quality of urban landscapes and space, Caquimbo Salazar (2009, p. 75) considers that the mentioned author 'brought in a closed idea of landscape as a mental construction through the concept of an environmental image that arises from the relationship with the city's physical space'.

The research methodology was implemented in two stages. The first stage was implemented in offices at the university and schools. In the second stage, a field survey was conducted. The first stage relied on seminars of themed presentations related to urban planning, the integration of students of the school and students of the Architecture and Urbanism course at UPF, development of workshops on mapping the town and Passo Fundo city, identifying guidelines that address the Master Plan of Integrated Development, the location of the school, and references of the city's urban spaces. The second stage dealt with the recognition and documentation of: (a) the neighborhood urban landscape; (b) urban land limits and use; (c) availability of community and services equipment; (d) urban mobility; (e) urban and sanitation infrastructure; and (f) systematisation, analysis, and interpretation of the data collected.

6 Results and Discussion

The results of this research were actions related to citizen awareness and the right to belong to the city, as well as knowledge on urban planning, ideas of sustainability, and the development of a critical outlook of the urban design process. The research involved the community, the school, and the neighborhood. In this way, the objectives intended in the project proposed by Capes and Fapergs were fully met, extending university scientific initiatives to community schools.

As such, the results reflect Agyeman's assertion (2003), which considers that people's transformation and training are important for the emancipation and construction of sustainable cities starting with their own locale. Another aspect approached by the author and directly reflected in the results of this work concerns the participative research agenda, wherein the professor is a learner and the student a co-researcher. Therefore, we report that for academic students and managers at UPF, living in the community and the school community alerted them to the real needs an urban project should address. At the same time, students from municipal schools were trained to adopt a critical thinking approach to the urban space in which they live.

The community professors' training to develop the project demonstrated that a strong learning pedagogy for professors, researchers, and managers involved in education on urban ecosystems is needed for the development of sustainable cities and communities.

The participation of exchange students, who have different viewpoints on education, culture, and urban space, enlightened participating students and communities. As such, they substantiate Volkmer's assertion (2005) on the transversal

themes and curricular programs as knowledge encouragement, citizenship, and preservation of heritage.

New challenges regarding providing innovative experiences to avoid the monotony of classrooms are difficult to address, and providing trans-disciplinary experiences in cultural or public spaces is still hindered in the academy. However, regarding the activities achieved, the participants' broad acceptance and enthusiasm were observed in creating proposals and integrative, critical, and pleasant actions.

Achieving the activities pertaining to scientific investigation alongside peripheral communities and integrating academic research with the community highlighted Volkmer's observations (2005) on creating an environment for dialogue between research, education, and citizenship. When using the city as a facilitator of inter-action, a positive strategy was employed wherein urban planning and sustainability focus on producing socially relevant scientific knowledge.

6.1 Results of the Students' Diagnosis

The neighbourhood analysis was based on Kevin Lynch's urban structure elements. To analyse urban landscape factors, the urban readability items proposed by Lynch (1997), which consider paths, districts, edges, nodes, and landmarks, as well as citizenship and sustainability concepts were adopted. An urban route from students' residences to the school was identified to determine improvements and symbolic elements included on this neighbourhood route. Furthermore, it was determined if these elements are related to other spaces in the city. These urban elements were then identified and located on local maps and the city map. For the neighborhood, the students focused on identifying the lot where each one's residence is located, analysing the permeable areas and areas built. Therefore, new methodologies with graphic responses provided through drawings and collages were proposed. The location of the housing unit on the lot of each student's residence was evaluated to verify the existence of permeable or non-permeable areas. The importance of permeable areas on the lot, in the neighbourhood, and in the urban area was analysed. For the implementation of the residence on the lot, the form of its roof was graphically represented and development calculated to verify the built imper-meable area, proportion, and relation between two areas, adding concepts and numerical expressions to the work. There was great interest from and personal fulfilment for the students in terms of the challenge of understanding (Fig. 2).

6.2 Results Based on the Urban Proposal Elaborated by Students

After studying themes related to urban insertion and considering the students' urban diagnosis, activities to develop critical thinking and the ability to propose urban and social improvements for their neighborhood were created. After observing the lack of urban equipment and leisure areas in the neighborhood, each student developed a schematic project demonstrating what they wanted their neighborhood to provide. Important elements proposed by the students included parks and squares, sports equipment such as blocks and skating ramps, cultural amenities such as movie theatres and areas for artistic performances, and spaces for life in society such as social tribunes (Fig. 3).

6.3 Instrumentalisation: The University and Community Inclusion

To complete the activities, the two schools were integrated for the activity on the urban route, which involved identifying locations on the maps, and later for the activities at UPF. On-campus activities included a visit to the Zoobotanic Museum
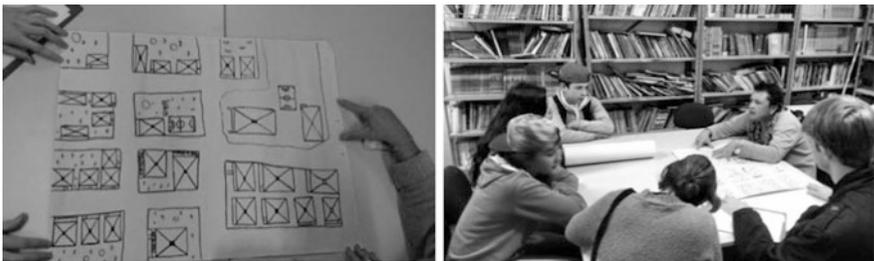

Fig. 2 Formulating maps of the neighbourhood and location of housing units. *Source* The authors

Fig. 3 Students developing maps of the ideal neighbourhood. *Source* The authors

Fig. 4 Visit to UPF. *Source* The authors

to see the museum project and exhibitions such as 'Biodiversity: Preserving Human Beings' and the 'Ecosystems of Brazil' (Fig. 4).

Later, the students visited two computing laboratories at the Faculty of Engineering and Architecture (FEAR), where they were helped by monitors and participated in the SketchUp workshop, which had already been started in schools: 1—To ensure this activity achieved its aims with 30 students from municipal schools, students of the Architecture and Urbanism program were invited to tutor this task. 2—The students and monitors were so excited that the activity was reported on the institution's web page. 3—For this workshop, eight monitors were present to help the students with their learning in the program and to draw a small residence and its surroundings.

6.4 Socialisation: Issues of Citizenship and Popular Participation

The activities developed throughout the research process culminated in the students' visit to the Chamber of Representatives of Passo Fundo city. The visit included an interview with a representative, who spoke about activities initiated by the Chamber of Representatives and importance of popular participation in the management and care of the cities. After the lecture and an interview with the representative on the concepts and students' analyses and diagnosis of each neighbourhood, she invited them to participate in the Popular Tribune, where one teacher and one student of each neighbourhood reported the needs identified by other classmates and representatives (Fig. 5).

Fig. 5 Visit to the Chamber of Representatives. *Source* The authors

6.5 Internationalisation: Sharing Knowledge and Culture

Exchange students from Argentina participated in the development of this research in the second semester. During weekly meetings, exchange students from the Architecture and Urbanism and Civil Engineering courses helped to teach urban concepts and participated in the urban program focusing on the peripheral areas of Passo Fundo city. Enjoying the special participation of the Argentinian students in the work proposed by the project, students in their ninth year at school attended a lecture on 'Argentinian Time', which was presented by the foreign students as a lecture on their country of origin, Argentina. For the lecture, Argentinian students prepared a short presentation on their country, culture, customs, food, games, flag, and of course, sports.

7 Conclusion

This research met the objectives of the public notice to integrate university and primary education. It also met the objectives of the proposal, which focused on increasing the community's awareness of citizenship and the right to the city, as well as their knowledge on urban planning, sustainability, and critical thinking of the process of urban design. Employing the analysis of the urban guidelines provided by the PDDI, a better understanding of public policies pertaining to the peripheral areas of the city was obtained. This made it possible to determine the quality of urban life based on the concept of sustainability and potential issues regarding the use of a sustainable urban infrastructure. For students in the fundamental school involved in this urban instrumentalisation and investigation process, there was a significant evolution in the development of citizens able to act to achieve their community needs. For academic students, community living alerted them to the real needs an urban project must consider, taking into account the principles of sustainability and citizenship.

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