Article

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VEGETABLE GARDENS AS A TEACHING RESOURCE IN EARLY CHILDHOOD EDUCATION[1]

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Abstract

The degradation of the environment resulting from high consumerism and environmental neglect on the part of human beings is increasing, and an option to combat this situation is awareness from early childhood, which can be done more effectively in schools through teaching resources and contact with the environment. Therefore, the objective of this research is to demonstrate that working with vegetable gardens in the educational space has the potential to be a teaching resource in Early Childhood Education. The research was carried out through a survey of works relating vegetable gardens and Early Childhood Education contained in the Periodicals Portal of CAPES (Coordination for the Improvement of Higher Education Personnel) and SCIELO (Scientific Electronic Library Online). The research demonstrated the potential of using this space in children's education. The six publications found and analyzed brought materials that classified vegetable gardens into six main aspects, in relation to the didactic resource: aid in teaching and learning, basis for activities, experimental support, motivational agent for students, facilitator of rapprochement with reality and material event. In this way, the research demonstrated that vegetable gardens have the potential to be a teaching resource for Early Childhood Education, enhancing humanization and relationships between children.

Keywords: Early childhood education; Teaching garden; Didactic resource.

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LAS HUERTAS COMO RECURSO MAESTRO EM EDUCACIÓN INFANTIL

Resumen: La degradación del medio ambiente derivada del consumismo y abandono ambiental del ser humano, una opción para combatir esta situación es la sensibilización desde la primera infancia, la cual se puede realizar en los centros escolares a través de recursos didácticos y el contacto con el medio ambiente. Por tanto, el objetivo de esta investigación es demostrar que el trabajo con huertas en el espacio educativo tiene el potencial de ser un recurso didáctico en Educación Infantil. La investigación se realizó mediante el levantamiento de trabajos sobre huertas y Educación Infantil contenidos en el Portal Periódico de la CAPES (Coordinación para el Perfeccionamiento del Personal de la Educación Superior) y de la SCIELO (Biblioteca Científica Electrónica en Línea). Las investigaciones han demostrado el potencial de este espacio en la educación infantil. Las seis publicaciones encontradas y analizadas trajeron materiales que clasificaron los jardines en seis aspectos principales: ayuda en la enseñanza y el aprendizaje, base para las actividades, apoyo experimental, agente motivacional, facilitador de acercamiento a la realidad y acontecimiento material. Así, la investigación demostró que las huertas tienen el potencial de ser un recurso didáctico para la Educación Infantil, potenciando la humanización y las relaciones entre los niños.

Palabras clave: Educación infantil; Jardín de enseñanza; Recurso didáctico

HORTAS COMO RECURSO DIDÁTICO NA EDUCAÇÃO INFANTIL

Resumo: A degradação do meio ambiente decorrente do alto consumismo e do descaso ambiental por parte dos seres humanos é crescente. Uma opção para o combate dessa situação é a sensibilização desde a primeira infância, podendo ser feita de forma mais efetiva nas escolas, por meio de recursos didáticos e do contato com o meio ambiente. Diante disso, o objetivo desta pesquisa é demonstrar que o trabalho com hortas no espaço educativo tem potencial para ser um recurso didático na educação infantil. A pesquisa foi realizada por meio de um levantamento dos trabalhos que relacionam hortas e educação infantil, contidos no Portal de Periódicos da CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior) e na SciELO (Scientific Electronic Library Online). O estudo revelou o potencial da utilização desse espaço na educação de crianças. As seis publicações encontradas e analisadas apresentaram materiais que enquadraram as hortas em seis aspectos principais relacionados ao recurso didático: auxílio no ensino e aprendizagem, base para atividades, suporte experimental, agente motivacional aos estudantes, propiciador da aproximação com a realidade e evento material. Assim, a pesquisa demonstrou que as hortas possuem potencial como recurso didático para a educação infantil, contribuindo para a humanização e o fortalecimento do relacionamento entre as crianças.

Palavras-chave: Educação infantil; Horta pedagógica; Recurso didático.

Introduction

Anthropogenic action on the ecosystem and climate is the main cause of environmental crises (Leite et al., 2021). Human choices regarding the environment, economy, and society have led to inequalities, poverty, and, most notably, the overexploitation of natural resources (Schu et al., 2021).

Erroneous decisions, consumerism, and disrespect for the environment are leading to species extinction and compromising the functioning of ecosystems (Leite et al., 2021). In light of this situation, and aiming to confront these crises, a change in thoughts, values, and perceptions about environmental preservation in the world we inhabit becomes necessary (Schu et al., 2021).

As a strategy to foster these changes in human beings from an early age, pedagogical gardens have been indicated by authors (Bezerra, 2021; Maronn, 2019; Tedde; Lima; Galante, 2019) as a strategy for cognitive stimulation and environmental repertoire. These spaces can act as socializers and re-signifiers of social knowledge, integrating the entire surroundings of educational institutions (Oliveira et al., 2018).

Thus, their implementation is of great importance in raising awareness not only among students but also within the school community, integrating everyone in the process of installation, management, and harvesting, in addition to pedagogical activities (Silva et al., 2022). They can also be used as a source of high-quality, low-cost food, promoting knowledge about healthy eating, disease prevention, and animal and plant preservation. Furthermore, they enable the interaction between theories and educational practices (Silva et al., 2021).

Studies involving the construction of green spaces in school environments have been growing and demonstrating diverse functions, such as that by Silva et al. (2022), who implemented an agroecological garden in a municipal school in Seropédica, which was successfully used as a pedagogical resource. Resende and Silva (2021) also implemented a garden, but their aim was to use it for the inclusion of students with disabilities, and to achieve this objective, they worked through sensory gardens.

The studies conducted so far have sparked interest in the topic, reinforced the understanding of the importance of these spaces in education, and stimulated reflection on how gardens teach, foster autonomy, and have therapeutic, occupational, and financial functions. These contributions align with works that highlight the relevance of incorporating environmental education into early childhood education, seeking the benefit of this interaction

from the first years of life. As exemplified by Silva et al. (2021), their studies demonstrate that working with environmental education promotes awareness practices capable of conscientizing.

Despite the existence of studies on the implementation of gardens and their general benefits for education, research involving the use of these spaces as a didactic resource is still scarce, especially in the area of early childhood education. This scarcity represents a loss, as the DCNEI (National Curricular Guidelines for Early Childhood Education), in its article 9, emphasizes that the EI (Early Childhood Education) curriculum should present pedagogical practices that promote interaction, care, and the preservation of knowledge about biodiversity and the sustainability of life on Earth, as well as care for natural resources (Brasil, 2009).

Given this scenario, the objective of this research is to demonstrate that working with gardens in the educational space has the potential to be a didactic resource in early childhood education. Therefore, firstly, a contextualization was carried out addressing environmental education focused on the humanization of children and didactic resources in this phase, followed by the methodology, results, and discussion of works found that address gardens, concluding with a reflection on the research.

Environmental Education for the Humanization of Children

Human consumerism threatens life on the planet, as this consumption, often driven by an increasingly industrialized society, results in environmental problems such as deforestation, burning, and the emission of polluting gases. These actions stem from both individual and collective human behaviors (Carneiro et al., 2023).

In this context, awareness-raising measures that hold individuals accountable for their actions on the environment become essential. Carneiro et al. (2023) emphasize that schools play a fundamental role in promoting these changes by sensitizing and establishing new habits from early childhood through interactions among teachers, students, and environmental education.

For this work, environmental education provides support for the development of educational practices aimed at caring for the planet. According to Article 1 of Law No. 9,795/1999, Environmental Education is understood as a process in which individuals and the community build social values, skills, attitudes, and knowledge directed towards environmental

conservation, the common good of society, and practices essential for life and sustainability (Brasil, 1999).

The importance of teaching environmental education is reinforced by Law No. 1,376/2021, which establishes that it must be a permanent and essential part of the early childhood education curriculum. This law highlights that environmental education should promote the holistic development of children and excellence in quality of life, fostering peaceful relationships among children themselves, with the environment, and with society (Brasil, 2021).

Thus, environmental education should be implemented in school institutions, and it can be supported by different didactic-pedagogical tools, including a project-based approach that integrates students, stimulating their creativity and reasoning (Silva et al., 2022).

Early childhood education, as the first stage of basic education, is premised on caring and educating. For the school, this phase represents a significant responsibility in the moral and ethical formation of young citizens. It is the institution's role to promote learning and expand knowledge acquired at home, while it is the family's responsibility to encourage protagonism and commitment to society and the planet. Therefore, this stage is fundamental for establishing contact with nature (Brasil, 1998).

However, educating is a complex process; education is present in the process that a child undergoes from birth, given that contact with the external world, social relations, and cultural productions corroborate this development of the psyche and enable a world of discoveries to support this process (Vygotsky, 1979). In view of this, Historical-Cultural Theory offers many contributions to education, as it is concerned with human development (Salami; Sarmento, 2011).

This concern is expressed in the concept of early childhood education, as established in Law No. 9394/96, Section II, Article 29, which characterizes it as the first stage of basic education. Its objective is to promote the holistic development of children up to five years of age, encompassing intellectual, social, psychological, and physical aspects, thus complementing the actions of the family and the community (Brasil, 1996).

This orientation aligns with the National Curricular Guidelines for Early Childhood Education (DCNEI) (Brasil, 2009), which reinforce the prevailing concepts of childhood, early childhood education, and curriculum. The DCNEI state that pedagogical practices for early childhood must be based on interactions and play, always respecting the ethical, aesthetic, and political principles that guide this stage of development.

According to the Vygotskyan perspective, development is profoundly influenced by the historical-cultural dimension, in which higher mental functions initially develop at the interpsychological level through interactions with others, and subsequently internalize at the intrapsychological level (Vygotsky, 1979).

Barbosa and Facci (2018) emphasize that, in historical-cultural psychology, humans differentiate themselves from animals due to their capacity to modify nature, being able to transform it and transform themselves. There is no finished human existence; the human being is the result of their interactions with the surrounding world. The construction of human consciousness is derived from relationships with objects, subjects, and nature (Vygotsky, 1979).

In summary, the individual learns in order to develop. In this process, the teacher plays a fundamental role by providing the necessary tools and support for the child to access the Zone of Proximal Development (ZPD), that is, the space where they can perform tasks with assistance. From there, they advance to the Zone of Real Knowledge, thereby enabling effective learning (Vygotsky, 1979). For this, it is up to the school to work and construct scientific concepts that promote the Development of Higher Psychological Functions, essential for the student's cognitive and emotional growth (Chaiklin; Pasqualini, 2011).

> Cultural transmission has special value, and particularly teaching/instruction (educating with intentionality and systematized method). He recognized that school education should adopt a pedagogy that guides the child's development towards functions in the process of maturation, instead of limiting itself to working only based on what the child is already capable of doing. This is because instruction already transmitted in a given area can transform and reorganize other areas of the child's thinking, [...] [instruction] can precede it [maturation] and accelerate its progress (Vygotsky, 1979, p. 128).

For effective teaching and learning, promoting significant awareness in the child, the National Common Curricular Base for Early Childhood Education (BNCC) (Brasil, 2018) establishes a curriculum aimed at this first stage of basic education. It organizes this curriculum around five fields of experience: the self, the other, and us; body, gestures, and movements; listening, speaking, thinking, and imagining; spaces, times, quantities, relationships, and transformations; traces, sounds, colors, and shapes.

Beyond the fields, the BNCC also defines six essential rights of development and learning: living together; playing; participating; exploring; expressing; and knowing oneself. These rights reinforce that knowledge is constructed through actions, play, and social interactions.

Another important concept highlighted in the Law of Guidelines and Bases of National Education (LDB) (Brasil, 1996) is that learning primarily occurs in childhood through social relations. These relations are potentiated in situations facilitated by the teacher, who plays a fundamental role in creating environments conducive to the development of these interactions. Thus, learning occurs not only through formal content but also through social contact and experiences lived in daily interactions at school.

> Thus, development also presents itself at two levels: one where the subject is able to operate alone, and another where the subject is able to operate with the support of a more experienced other. The distance between the two levels is called the zone of proximal development (ZPD), which occurs through the mediation of social others and are psychological tools embodied in another person, in the sign, in play, and in teaching situations, for example (Aquino, 2015, p. 41).

Vygotsky emphasizes the teacher's role as a driver of psychic development and of the skills the child already possesses, evaluating those they can still acquire, analyzing the context in which they are inserted, and the conditions they have for this development to occur. Vygotsky contributes significantly to education; one of his main contributions is defending the importance of learning processes, taking into account history and culture, which are extrinsic to the individual (Vygotsky, 1979).

In this perspective of working with social interactions, communication, and bringing concepts from the student's experience through efficient mediation by the teacher, an environment that allows contact with nature, didactic resources facilitate and bring efficiency so that the learner can develop fully, providing playfulness, practical interaction, and connection between reality and theory (Maia et al., 2020).

Therefore, we can emphasize that historical-cultural theory is a support in understanding child development and learning. Working with concepts that highlight the importance of human behavior and emphasize the impacts of human actions on the environment and life is essential; these concepts are contained in laws, but it is not enough to simply present them to children. The way the teacher transmits them and how they are received by the children must be considered and taken into account in educational planning, as well as the resources to be used (Maia et al., 2020).

Didactic Resources in Early Childhood Education: Gardens as a Didactic Option

Working with differentiated ideas, utilizing diverse resources and tools, enables children to experience new ways of acquiring knowledge (Lopes, 2019). According to Nascimento and Campos (2018), "didactic resources are all tools that assist in the teaching and learning process, with the main function of facilitating comprehension of the subject matter addressed by the teacher." They encompass a wide range of pedagogical instruments and methods that organize the teaching process, provide experimental support for lessons, and motivate student learning, among other functions (Batista; Aureliano, 2023; Escolano; Marques; Brito, 2010; Lopes, 2019; Souza, 2007).

From this perspective, gardens are an important strategy for discussing ecological and environmental themes in education. They are highly effective resources for organization and motivation, in addition to promoting basic understandings such as initial counting, organization, sequencing, and developing motor skills, described as a space for plant cultivation (Silva et al., 2021).

Their construction and maintenance are considered a living laboratory that supports pedagogical activities in education, aiding in the development of interdisciplinary actions and contributing to the construction of relationships and sustainable development through collaborative work among society, educators, and learners (Dolianitis et al., 2018).

Martinez and Hienka (2017, p. 4) state that:

> The school garden, in addition to being a playful learning space and a living laboratory, acts as a facilitator of learning by addressing school curriculum content, working on values such as: respect, cooperation, initiative, companionship, responsibility, integration, and solidarity.

This playful and developmental environment can be used to experience environmental education, which is mandatory from early childhood and of great importance in the construction and formation of human beings, as it is at this moment that the child is forming their habits and developing opinions (Martinez; Hienka, 2017).

Batista and Aureliano (2023) emphasize that content explored merely through expository classes, without student participation, tends to be forgotten more easily due to a less efficient learning method. Therefore, the adoption of methodological diversity in developing a

lesson plan is crucial. Although beneficial, the association with didactic resources is not always utilized or explored adequately, due to difficulties in innovating practices.

Batista and Aureliano (2023, p. 3) state that:

> There are many types of didactic resources to be used in the classroom that play an important role in the child's cognitive development. Given such variety, there is a need to think and reflect on how to use these resources and which are the most appropriate for the development of students' competencies. Often, when the student participates in the construction of the resource and works actively, they find it easier to learn effectively and memorably.

Rodrigues et al. (2018) explain that didactic resources influence children's cognitive development because, through the exercise of observation, they allow for an approximation with reality, resulting in greater retention of content. Their importance is significant, given that learning differs for each student, and this approximation with reality, combined with the integration of practice and theory, makes what is being taught more palpable.

The implementation of projects involving gardens constitutes concrete resources, based on the fact that agricultural practices favor concrete learning experiences, promote autonomy, expand competencies and skills, stimulate the exercise of citizenship, awaken concern for social problems, and contribute to the construction of their own life projects (Paraná, 2022).

In addition to providing learning spaces, the execution and formulation of activities and the educator's mediation are essential. Teaching about the environment, healthy eating, interdisciplinarity, socialization, offering challenges, and preparing for living in society are also responsibilities of this professional, and alternatives that assist them are necessary tools in the educational process.

Tools such as school gardens represent valuable alternatives in this educational process, enabling changes in habits in the lives of students, the school community, and society as a whole (Dolianitis et al., 2018).

We reiterate that they also allow for working with fresh foods, enabling children to participate in the entire food production process, accessing vegetables and greens they might never have encountered, and thereby encouraging the consumption of these foods and reducing waste, given that childhood is when children begin to acquire their eating habits, which will likely persist (Carneiro et al., 2023).

Throughout this entire process, it is appropriate for children to participate comprehensively in the implementation of a garden, from choosing the location, variety, and

harvesting process, feeling part of the process, which makes it more significant for them and thus attracts their attention more emphatically. Green spaces such as gardens have excellent potential to aid in the educational process, but are they utilized as such?

Methodology

To achieve the aforementioned objective, an exploratory bibliographic research methodology was chosen. This approach aimed to identify studies focused on the pedagogical use of gardens in early childhood education, specifically seeking applications and characteristics that qualify them as didactic resources.

Lösch, Rambo, and Ferreira (2023) define exploratory research as a type of study that seeks to explore or understand a phenomenon or a question of interest. Its purpose is to contextualize and explore little-known subjects, with the perspective of constructing hypotheses about the theme to be addressed. In the case of this study, this translates to investigating the use of gardens as a potential didactic resource for early childhood education.

For the selection of articles that comprised the data collection, the CAPES Periodical Portal and SCIELO databases were utilized. The search in both periodicals was conducted on January 7th, initially by subject, using the titles: "hortas na educação infantil" (gardens in early childhood education) in CAPES and "horta na educação" (garden in education) in SCIELO. Subsequently, the following filters were applied: peer-reviewed articles, open access, and published between 2014 and 2024.

With the articles selected by subject and applied filters, a further selection of research that discussed, in some way, the use of gardens as support for teaching children in early childhood education from 2014 to 2024 began. The titles, abstracts, and keywords of the materials were examined to identify works that met the criteria.

This process allowed us to identify studies published within a ten-year period that linked the use of gardens and early childhood education, relating the applicability of these spaces and their uses to the characteristics of didactic resources. We then compared the findings in the literature that guide the characterization of a didactic resource with the importance of employing gardens in children's education.

After verifying the number of articles present in the periodical portals, the content described within them was analyzed to identify uses or statements that characterize the garden within one or more of these applications: an aid in teaching and learning; a basis for organizing

a didactic activity; an experimental (or exhibition) support; a form of motivation for children; an approximation with reality; and a tangible event. After identifying these uses, they were organized into a table for subsequent analysis.

The objective and results from the selected articles were also extracted to identify diversity in the utilization of gardens, their various applications, and whether they truly contribute significantly to didactic uses. Following the identification of the objective and results of each study, they were placed in a table for subsequent analysis and discussion based on the existing literature.

Characterization of a Didactic Resource

To determine whether gardens qualify as didactic resources, we established six applications (categories) that could be present in the discussions and applications within the selected articles. Their appearance in one or more categories would justify their potential as a didactic resource.

To establish these applications of gardens, we first consulted the literature for definitions of didactic resources. Subsequently, based on these definitions, we selected the characteristics that appeared most frequently when describing what constitutes a didactic resource in education. The aim was to verify if the studies on the topic contained statements or practices that fit into one or more of the definitions present in the literature.

This separation yielded six uses derived from this selection, which appear as key aspects in characterizing a didactic resource in educational publications. The studies exhibited variations in their descriptions, and from these, the aforementioned uses were compiled.

The first use identified was aid in teaching and learning. The second was a basis for organizing a didactic activity, as proposed by Souza (2007). Third was experimental (or exhibition) support, put forth by Lopes (2019). The fourth was a form of motivation for students, suggested by Batista and Aureliano (2023). Finally, the fifth and sixth uses were approximation with reality and being a material event, respectively, drawn from the definition by Escolano, Marques, and Brito (2010).

Based on these categories, keywords for each category were extracted and researched in an online Portuguese dictionary to support the selection of statements and activities from the analyzed studies. To finalize, the categories were tabulated, presenting actions and statements

from each study that positioned gardens within these categories. This enabled us to verify whether gardens demonstrate potential as a didactic resource based on fulfilling one or more of these uses.

Table 1 - Key words from the categories for characterizing teaching resources.

Keywords for use	Meaning based on the dictionary (Dicionário Online de Português)
Support	" Contribution or collaboration in the preparation and completion of a task; help".
Basis for organization	"That which is used as support, support, the basis of construction. What tends to define something".
Experimental support	"What is used to support an experience in practical knowledge".
Motivation	"The act or effect of motivating, of arousing interest in something: the compliments served as motivation to improve."
Getting closer to reality	"Getting closer to what is real".
Material event	"A tangible event".

Source: Autor (2024)

Results and Discussion

During the literature search, 33 publications involving "garden" were analyzed, with 16 found in the CAPES database and 17 in SCIELO. This number of examined articles was reached through the selection criteria mentioned previously.

Out of this total, 6 publications were selected for meeting the research requirements, involving the relationship between early childhood education and the use of gardens. The remaining unused publications primarily covered topics such as community gardens, food perception, health, agriculture, environmental quality, and medicinal uses, thus not encompassing impacts or influences on early childhood education and consequently not being included in this study.

Of the total works analyzed, the 6 selected studies investigated the impact of gardens on early childhood education and how they can be or have been utilized, encompassing the perspectives of teachers, students, or authors. These studies are highlighted in Table 2 for the purpose of this review.

Table 1 - Data from the selected articles.

Scientific journal	Title	Study	Citation	Data base

Dialogia	School gardens in the pedagogical practices of nursery school teachers.	1	Bandeira; Zanon (2023)	CAPES
Revista Insignare Scientia	Building a vertical vegetable garden: an approach in early childhood education to sensitize students about caring for the environment.	2	Maronn (2019)	CAPES
Debates em Educação	Science in early childhood education: exploring the age of why	3	Jardim (2020)	CAPES
Em Extensão	DIST Shopping Park project's community garden workshops as an ally in income generation, food security and environmental education for the community.	4	Tedde; Lima; Galante (2019)	CAPES
Revista Eventos Pedagógicos	Children in nature in the context of early childhood education.	5	Bezerra (2021)	CAPES
Saúde Social	Experiences of planting and eating: the school garden as an educational practice, from the perspective of educators.	6	Coelho; Bógus, (2016)	SCIELO

Source: Autor (2024)

While the number of published works analyzing gardens in early childhood education in the reviewed journals is limited, their titles alone reveal a diverse range of applications. These include pedagogical strategies for teachers, methods of raising awareness, ways to spark inquiry, and topics related to food security, environmental education, and health promotion, as shown in the second column of Table 2.

This broad scope of applications aligns with the requirements of a didactic resource as described by Lopes (2019), who states that didactic resources can diversify teaching subjects and approaches, allowing for the exploration of multiple topics and even fostering interdisciplinarity.

The scarcity of publications on the theme of gardens in early childhood education is also evident from the fact that the authors of the works are from different universities, and the publications appear in journals with varying Qualis ratings, with publications starting more recently, covering the period from 2016 to 2023. An important observation is that none of the authors of these six studies are from the State University of Londrina, even though Londrina has 33 Municipal Early Childhood Education Centers (CMEIs), and 15 of these have gardens that are supported by agronomists from the Londrina city hall ([Londrina, 2024]).

The objectives identified in the analyzed works demonstrate the versatility of green spaces, where gardens in their various forms become a way to encourage reflection on topics such as environmental responsibility, foster childhood curiosity, serve as a space for workshops, facilitate the listening of children's ideas, and promote care for health and environmental issues (Table 3).

These benefits are echoed by Martinez and Hienka (2017), who describe gardens as a playful learning space, a living laboratory for free exploration, and a versatile tool that allows for the exploration of curriculum content and values. Carneiro et al. (2023) highlight the garden as an important teaching strategy, serving as a tool for working with fresh foods and enabling children to participate in the entire food production process.

Table 3 - Objectives and results of the selected articles.

Study	Objective	Results
1 (Bandeira; Zanon, 2023)	Analyze how school gardens are present in the pedagogical practices of early childhood education teachers (Bandeira; Zanon, 2023, p. 2).	School gardens in the pedagogical practices of early childhood education teachers are present as a way of enabling an active subject in the construction of knowledge, addressing themes such as environmental education, adding interest on the part of the students, favoring transdisciplinary work, allowing a greater conception of reality and collective work. What's more, the children's interest in the gardens has sparked community participation (Bandeira; Zanon, 2023, p. 14).
2 (Maronn, 2019)	Providing moments of reflection on environmental responsibility; assembling the garden using small plants; understanding the contributions of a vertical garden in the school context; and raising awareness of the importance of reusing recyclable objects discarded in everyday life (Maronn, 2019, p.306).	The activities carried out helped raise awareness among children, teachers and staff about sustainability and the reuse of recyclable materials. This practice also stimulated the diversification of activities, interdisciplinarity and the discussion of environmental education (Maronn, 2019, p.310).
3 (Jardim, 2020)	Checking how to take advantage of children's curiosity to build knowledge; describing the possibilities of linking content to the routine of early childhood education; identifying possible situations to associate science content and proposing science activities for this stage of education (Jardim, 2020, p.3).	The curious outlook that children in early childhood education have should be taken advantage of and allows them to see that science content is present in many everyday activities. This is a time to take advantage of playful and interactive methods to expand learning and insert content into students' daily school and social lives (Jardim, 2020, p.12).

4 (Tedde; Lima; Galante, 2019)	Analyzing the importance of the workshop for the community by interpreting the impact generated by the implementation of the vegetable garden at the EMEI, together with the environmental education presented both to the children in the workshop and to the children who are part of the school, in addition to having the objective of also presenting the generation of income that the workshop was able to offer its members, through the sale of the products and the creation of the enterprise, combined with the food security that an organic vegetable garden offers to those involved (Tedde; Lima; Galante, 2019, p. 25). organic garden offers to those involved (Tedde; Lima; Galante, 2019, p. 112).	The workshops on community gardens and medicinal herbs were successful in bringing environmental education closer to the community, changes in the children's diet who opted for more natural and healthy products, and also became a source of income for homeless people who entered the job market again (Tedde; Lima; Galante, 2019, p.119).
5 (Bezerra, 2021)	Contribute to recent research that seeks to understand children's points of view, focusing on their actions and their participation in the world (Bezerra, 2021, p. 505).	The responsive and careful attitude of teachers in the intervention of pedagogical practices that focus on nature is essential, making it possible to understand that environmental education for young children needs to be close to nature. Providing children with contact with nature enables them to experience space and its importance (Bezerra, 2021, p. 511).
6 (Coelho; Bógus, 2016)	To understand the production of meanings in food among educators, resulting from their involvement with the school garden. Specifically, to understand how personal experiences of involvement with planting and the experience of participating in the school garden contribute to building a relationship with food (Coelho; Bógus, 2016, p. 764).	The development of the vegetable garden made it possible to see meaning in many of the activities developed, such as: the importance of exchanging experiences, the practical experience of theoretical content, how necessary care is in life, closer contact with nature, with people and with food (Coelho; Bógus, 2016, p.769).

Source: Autor (2024)

Still, in Table 3, the results presented in the third column of the articles clearly demonstrate the effectiveness of using green spaces as a didactic resource. Bandeira and Zanon (2023) show the awakening of community participation in managing gardens and the recognition of their importance in education. Maronn (2019) highlights the environmental awareness among staff, students, and teachers. Jardim (2020) points to increased child curiosity. Tedde, Lima, and Galante (2019) describe the implementation of environmental education workshops. Bezerra (2021) emphasizes direct contact with nature and the availability of a play

area. Finally, Coelho and Bógus (2016) demonstrate the relationship between personal experiences and building a connection with food.

All the results from the analyzed articles underscore the importance of pedagogical gardens. This strongly supports Carneiro et al. (2023), who state that school institutions are the most suitable environments to address food health, active environmental action, and the promotion of responsible values, emphasizing the essential role of effective teacher performance and the use of efficient resources.

The utilization of gardens in schools, along with their diversity and importance, is clearly demonstrated by their objectives and results. Furthermore, their characterization as a didactic resource for early childhood education stems from their alignment with one or more of the six characteristics selected based on the literary definition of didactic material, as presented in Tables 4 and 5.

Table 4 - Procedures and statements compiled from the first three categories of teaching resources

Study	Teaching and learning support	Basis for organizing a didactic activity	Experimental support (or exposure)
1 (Bandeira; Zanon, 2023)	The gardens are used to teach healthy eating, respect for the environment and conscious education (p. 6-7).	Classes with vegetable gardens focus mainly on showing where food comes from for a healthier diet (p. 7).	It is used for topics such as water, light, plant growth and food. Contact with the environment allows children to visualize it concretely (p. 8).
2 (Maronn, 2019)	The vegetable garden and all the processes involved in setting it up were used to discuss nature conservation and healthy eating (p.308).	Handing out seedlings to the children for environmental education (p.308).	Growing and planting vegetables in environmental education (p.308).
3 (Jardim, 2020)	Help with science subjects (p.7).	The vegetable garden is the basis for working on various issues, from health to eating habits, as well as a space for interaction (p.8).	The whole process of implementing and running the garden should involve the children asking questions about health, food and plant life (p.8).
4 (Tedde; Lima; Galante, 2019,)	To run community garden workshops teaching students about spending, consumption and entrepreneurship (p.116).	In addition to a workshop with broad participation from the community and children who took part in planting and composting (p.117).	Installation of vegetable gardens with compost bins to reuse uneaten food (p116).

5 (Bezerra, 2021)	When taken to the children's space, it becomes a place of discovery and sensation, although it is still a challenge for teachers to observe and enhance the vegetable garden as a space that is part of the children's daily lives (p.509).	There are no reports of educational activities on site.	It's not used as such, but it shows the potential to get children interested in exploring the animals and vegetables present in the environment, as well as asking the researcher if he knows where the food comes from and tasting it straight from the garden (p.510).
6 (Coelho; Bógus, 2016)	The gardens were used to learn about the origin of food, and direct contact with the produce also made it possible to experience care, such as the planting of oregano described by one teacher (p.765).	The teachers say that there are weekly timetables for garden activities set out in the curriculum (p.765).	The gardens were presented by the teachers as a place to discuss the origin of food, plant development and nutrition (p.765).

Source: Autor (2024)

In all analyzed studies, the garden was presented as a supportive resource for teaching and learning, contributing to the explanation of themes related to healthy eating and nature preservation. Furthermore, it served as a space for delivering science content and conducting workshops. This approach aligns with Souza's (2007) view, who defines a didactic resource as "any material used as an aid in the teaching-learning of the proposed content to be applied by the teacher to their students."

From the same perspective, five out of the six works present the garden as the basis for an applied activity, whether to demonstrate the origin of food, distribute seedlings for environmental education, serve as a site for questioning healthy habits, or facilitate composting.

In most works, the environment is denoted as a support for teaching practices with direct contact with plants, water, and soil, in addition to participation in the entire installation and management process. In this regard, Lopes (2019) states that "didactic resources comprise a diversity of pedagogical instruments and methods that are used as experimental support in the development of classes and in the organization of the teaching and learning process."

Table 5 - Procedures and statements compiled from the last three categories of teaching resources

Study	Motivation (student development)	Getting closer to reality	Material Event

1 (Bandeira; Zanon, 2023)	The great interest in vegetable gardens and environmental education themes is evidenced by the fact that 76% of the teachers in the survey often mention these practices in their lessons (p.8).	Living in the garden space makes it part of the child's life and, introduced into everyday habits, allows them to experience change (p.9).	Teachers' reports on the use of vegetable gardens (p.5).
2 (Maronn, 2019)	Right from the start, the children showed interest (p.307).	It was carried out through questioning, seeking to relate everyday acts to the activities in the garden (p.307).	Building a vertical vegetable garden (p.306).
3 (Jardim, 2020)	Brought about as a result of interaction in the environment (p.507).	Getting closer to reality is achieved by experiencing the environment and correlating it with the children's daily life (p.507-508).	The possibility of working with vertical gardens as a start to contemplating a green space (p.8).
4 (Tedde; Lima; Galante, 2019)	The first vegetable garden workshop led to a new vegetable garden development project for the community (p.117).	Uniting scientific and popular knowledge in the implementation of vegetable gardens (p.113).	Building community gardens through joint efforts (p.113).
5 (Bezerra, 2021)	Together with the researcher, the children ask to see the garden and interact with it (p.510).	The vegetable garden is next to a park with free access for children (p.507).	Physical garden built in association with the community and free access for children (p.507).
6 (Coelho; Bógus, 2016)	The children's interaction with the process of planting, caring for and harvesting is described by the teachers as an experience they enjoy and want to take part in, making them feel part of the production (p. 766).	The educators associate the vegetable garden with environments familiar to them from when they lived on the farm, a rural experience, and see the space as a place for interpersonal exchanges (p.765).	Apresenta os relatos dos professores e coloca as hortas como uma fomentadora do contato direto com a natureza, possibilitando a criança ver o que ela plantou e cuidou crescer, além de se alimentar com que foi colhido (p.767).

Source: Autor (2024).

Regarding motivation, the garden provided this to everyone involved in its implementation, management, and use. This was apparent in the students' enhanced learning, the teachers' recognition, the establishment of more gardens, and the desire to participate in them. Batista and Aureliano (2023) state that "didactic materials are understood to be motivators and stimulators of learners' development," aligning with the data presented in Table 5.

Didactic resources are also viewed as all tools that aid teaching and learning, enabling learners to connect content with their lives and materialize it in reality, thereby facilitating their comprehension of the content (Escolano; Marques; Brito, 2010). This corroborates the applications of approximation with reality and material events, which all articles fit into, resulting in the construction of a physical garden and the recognition of its benefits across all studies.

In terms of approximation with reality, the space fostered interaction among children, prompted questions, and connected with their daily lives, in addition to uniting the external community with the internal school environment. This aligns school gardens with the concept proposed by Dolianitis et al. (2018) as a valuable tool for teachers, enabling habit changes in the lives of students, the school community, and society as a whole.

Given all the uses and practices present in the selected studies, it was possible to conclude that gardens do indeed have the potential to be a didactic resource applied in early childhood education, highlighting their capacity to address a diversity of content and contribute significantly to children's development. Despite the scarcity of studies in this area, school practices can be expanded through the use of gardens.

Final considerations

Based on the publications found, gardens demonstrate significant potential as a didactic resource in early childhood education. The results of the analyzed studies show that gardens contribute to education by providing support, motivating children, expanding knowledge, updating topics for discussions, teaching about healthy eating and sustainability, and promoting interaction with the environment. These contributions consistently fit into more than one of the categories established in this study.

The research revealed that, despite their benefits, studies in this area are scarce. Therefore, raising awareness about the potential of gardens in schools could foster greater utilization of these green spaces within institutions and society.

Thus, this study addresses an environmental issue and illustrates how working with nature from early childhood can cultivate awareness and care for the planet. The studies highlight gardens as a crucial link in the human-environment relationship, promoting playfulness, motivation, agency, critical thinking, and inquiry in children.

This study effectively demonstrates the potential of gardens as a didactic resource in early childhood education, though this is just one aspect that this data review allows us to explore. The analyzed articles also shed light on other important points, such as the challenges faced by early childhood education teachers in publishing their experiences, the disconnect between universities and educational institutions, and the obstacles educators encounter when trying to integrate these spaces into pedagogical practices.

Therefore, this work proves important by offering support to teachers, who can draw upon diverse ways to use gardens in their pedagogical practices. It emphasizes the relevance of these spaces in children's learning, highlights their reach within the communities surrounding institutions with gardens, and points to the positive effects on the health and well-being of all who interact with these environments. Furthermore, it opens doors for researchers to continue exploring and writing about the use of gardens in education, thereby expanding knowledge and strengthening this educational practice.

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