

Food and Nutrition Education integrated in a holistic educational model

Educação Alimentar e Nutricional integrada a um modelo educacional holístico

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ABSTRACT

Objective

To propose elements for the development of Food and Nutrition Education practices integrated to pedagogical activities for children.

Methods

This is a qualitative case study, with participant observation and semi-structured interviews, carried out in a non-formal learning space, that is inspired in anthroposophy, Slow Food movement and Pikler approach. Participants were 13 children aged one to four years and three educators, and the data were interpreted by reflexive thematic analysis, using the Complex Thought as a theoretical framework.

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Results

The Food and Nutrition Education was consolidated in different pedagogical activities, such as cultivation practices, reverence in dealing with food, rituals and sharing, in an environmental and transdisciplinary approach.

Conclusion

Nutrition education activities as part of a relationship with the environment and the planet, seen from a transdisciplinary perspective, is a differential in the formation of principles and values in early childhood education.

Keywords: Child, preschool. Education. Food and nutrition education.

RESUMO

Objetivo

O artigo busca propor elementos para o desenvolvimento de práticas de Educação Alimentar e Nutricional integradas a atividades pedagógicas para crianças.

Métodos

Trata-se de um estudo de caso qualitativo, com observação participante e entrevistas semiestruturadas realizadas em um espaço de educação não formal, inspirado na antroposofia no movimento slow food e na abordagem Pikler. Os participantes foram 13 crianças de 1 a 4 anos e três educadores e os dados foram interpretados por meio de análise temática reflexiva, tendo como referencial teórico o Pensamento Complexo.

Resultados

A Educação Alimentar e Nutricional foi consolidada em diferentes atividades pedagógicas, como práticas de cultivo, reverência aos alimentos, rituais e partilha, em uma abordagem ambiental e transdisciplinar.

Conclusão

As atividades de educação nutricional como parte da relação com o meio ambiente e o planeta, vistas de uma perspectiva transdisciplinar, são um diferencial na formação de princípios e valores na Educação Infantil.

Palavras-chave: Pré-escolar. Educação. Educação alimentar e nutricional.

INTRODUCTION

The current scenario of nutritional status, including the remarkable prevalence of childhood obesity, and the alarming environmental impacts resulting from the food production system, highlight the importance of effective Food and Nutrition Education (FNE) strategies [1-10]. Furthermore, food involves complex individual and collective aspects, ranging from taste preferences to economic and political interests of society, so improving dietary habits is a challenge [11-13].

Food and Nutrition Education strategies must consider food in a contextualized to an individual's life, considering the various factors linked to this context. Moreover, recent publications suggest the importance of food being positive for human and planet health, highlighting the importance of individuals' involvement with the food system for FNE promotion [14-16]. Childhood is a critical period for the formation of several habits, including eating habits, so FNE for children is relevant to create awareness about food and the planet [17-20].

Holistic education considers the transdisciplinarity and integrality of the human being, suggesting that an individual be educated to the world as a whole [21-26]. Thus, this educational approach may support the application of FNE in an integrated way to people's lives. Holistic education strategies have stood out in the area of FNE and research that reveals the implementation of this educational approach, such as the present study, can contribute to expanding these initiatives both in non-formal (as the educational space focused on in this research) and formal education (schools engaged in the education system) [27,28].

The Complex Thought, proposed by Edgar Morin [29-31] and, particularly, the Seven Complex Lessons in Education for the Future [31], enables an analysis of educational initiatives that propose to be transdisciplinary. Analyzing educational experiences in the light of Complex Thought can bring elements to a FNE that transcends the disciplinary approach, aimed at health benefits. This analysis supports a subjective and interrelated interpretation of the results so that their totality and each part that composes them, as well as their multiple interactions, were considered simultaneously. Complex Thought is widespread in the area of education and less used to interpret health-related issues (especially related to food), which is a differential of this study.

This research aimed to propose elements for developing FNE practices integrated to pedagogical activities for children, exploring a holistic educational model, and to interpret it using the Complex Thought and the Seven Complex Lessons in Education for the Future, in order to identify elements that can be incorporated into transdisciplinary programs with FNE [29-31].

METHODS

This is an exploratory and cross-sectional qualitative case study (in order to understand objective and subjective aspects of the phenomenon) about a non-formal out-of-school learning space described below [32-34]. This educational space is open from Monday to Friday mornings and offers holistic experiences for children aged one to four years, inspired in anthroposophy, Slow Food movement and Pikler approach, which have in common: the totalizing view of the human being, their development, and their relationship with others and with the world; and food-related issues, considered in their multidimensionality [35-45]

The learning space structure consists of a playing room (with an integrated kitchen), an outdoor area with a large tree and a sandpit, and an extensive backyard, with a vegetable garden and orchard. Founded by a couple of educators, the space is private and not engaged in the formal education system.

All children and educators present participated in this research: three educators (two founders and one collaborator) and 13 children, which is the maximum capacity of the educational space, according to the educators themselves. Data were collected in 2018 and 2019, using participant observation and semi-structured interviews. Participant observation was carried out until data saturation, allowing the necessary immersion to better explore the studied context [46] Observations of activities, interactions, behaviors, and expressions of educators and children were recorded in a field journal, transcribed after each observation day, in order to organize and perform a first data interpretation.

The interviews were scheduled with the educators after participant observation began, making possible to clarify issues noted during the observation process. The author carried out the interviews from a flexible script, to allow greater freedom of expression to the respondents [47]. The questions included aspects such as personal and professional motivations, trajectory, inspirations, considerations and difficulties about the mentioned learning space. The founding educators were interviewed together, and the collaborating educator was interviewed individually. The interviews were recorded on a portable audio recording device.

The notes in the field journal and the interviews, after being transcribed, were interpreted using reflexive thematic analysis [48-51]. An organic process of coding (exploratory, flexible, and interactive) was carried out, based on the researcher's subjectivity and her intimacy with the data as well as the process of reading and re-reading them and their recursive, deductive, and inductive interpretation. In this process, codes were created, grouped in themes, revised, and named for the narrative writing.

The Complex Thought was used as a theoretical framework, considering the transdisciplinarity inherent in all knowledge [21-23, 29-31]. Thus, the data were considered as a phenomenon (i.e., elements woven together), which comprises an interrelation of all systems that participate in it, in order to go beyond the sum of the parts, considering the set of relationships that permeate them multidirectionally. In this study, the whole is the non-formal educational holistic space and the parts are the elements that integrate it: physical structure, activities carried out, educators, children, and the existing relationships in this context. The interpretations considered the data in the light of the Seven Complex Lessons in Education for the Future, described in Chart 1 [31].

Chart 1 – Description of seven complex lessons in education for the future.

Knowledge/lesson	Description
I - Detecting error and illusion	All knowledge is a translation of reality, through one's perception and ideas, so it runs the risk of betrayal; there is a risk of error.
II - Principles of pertinent knowledge	Knowing how to contextualize one's knowledge, inserting it into the whole to which it belongs.
III - Teaching the human condition	Understanding our connection with the natural world, but also our differences. Our consciousness and our culture make us different from nature. We have a double identity: biological and human.
IV - Earth identity	Our identity is inherent to human beings. The treasure of human unity is human diversity and the treasure of human diversity is human unity. We now share the same future in the planetary epoch in which we live, we have the same vital problems and the same fatal threats. This is why we must consider Earth as our home.
V - Confronting uncertainties	The future is uncertain, for each individual and for the planet. To confronting uncertainties, it is important the awareness that the present is not immobile. Expect the unexpected. All the decision we might take are nothing but wagers. This awareness allows us to monitor our actions and modify our strategy, taking events into account to transform them.
VI - Understanding each other	Education should teach us how to be self-observant and self-critical, so as to be able to see that each person practices self-deception. Being mindful of complexity to see the multiple aspect of the other, not just see the side we don't like. Teaching people how to show kindness.
VII - Ethics for the human genre	Anthropo-ethics. Teaching planetary citizenship (identity of the human being). Solidarity and responsibility.

Note: Adapted from Morin [31].

To support the credibility of this research, the data crystallization process was carried out [52]. Thus, the data were reviewed by educators and peer-reviewed by a Complex Thought researcher. This study, approved by the Research Ethics Committee (Protocol 99311518.8.0000.5440), meets the 21 criteria proposed by the Standards for Reporting Qualitative Research (SRQR) [53].

RESULTS

It was conducted 20 days (76 hours) of participant observation and four hours and 26 minutes of recorded interviews. Chart 2 describes the themes and categories resulting from the interpretation.

Chart 2 – Categories and themes.

Categories	Themes
The educators and the method	Transparency and sincerity: the importance of being true Flexibility to schedule activities: the method molded based on observation
The experiences: focus on the full development of the child	Autonomy Curiosity and creativity Sharing Living the present Sustainability and involvement with the food system

The educators and the method

Transparency and sincerity: the importance of being true

Transparency and sincerity are basilar to the learning space' philosophy. Educators consider themselves to be role models for children, therefore, they act consistent with what they say. As the educator reported: "Education goes through a process of really self-education" and, complementing, "[it is fundamental] to be true to the child".

Families know the philosophy of space, but they do not always adopt the same ideals at home, making children live in different environments, with multiple and sometimes antagonistic experiences. Educators argue that this represents alternatives for children who deal well with this process, as the collaborating educator said: "They start to understand that there are different universes, there are different possibilities [...] and so [the children] insert themselves into new societies, until they realize that they are inserted in the great society and that they have a million possibilities".

An example of this is vegetarianism, adopted in this learning space and not adopted by some of the families. Meat consumption is discouraged by educators due to their own life orientations, considering health issues, environmental preservation, and animals' feelings. Striving for transparency, when a child asks about meat consumption, educators say that it comes from animals, which they like and respect.

Flexibility to schedule activities: the method molded based on observation

The activities are based on theoretical frameworks and chosen according to educators' observations of outward manifestation of nature and children's mood. On rainy days or if children are less energetic, indoor activities are prioritized, while on sunny days or if children are very energetic, outdoor activities are prioritized. As the educator reports, this learning space is "the place of freedom for the educator", considering the flexibility in scheduling activities.

The method is shaped based on children's observation and daily feedback among educators themselves and between educators and children's families, which means that the method is constantly reconstructed, not based only on theoretical precepts. Thus, educators observe that aspects of a pedagogical theory are not a mirror of reality, recognizing the blind spots of knowledge and facing uncertainties everyday [31].

The experiences: focus on children's full development

The daily pace of this holistic learning space consists of initial activities, snack time, and final activities. Activities include: playing in the sandpit; toys (wooden or other non-synthetic materials, some with pedagogical purposes); storytelling and theater (inspired by fairy tales or Brazilian folklore); experiencing colors (free drawings with crayons or watercolor); embroidering (for older children, with pointless needles); yoga (in a playful way, imitating animals); free playing; small chores (watering plants, organizing a snack place, putting toys away); preparing recipes; visiting the backyard, among others.

The activities have interconnected pedagogical roles, aiming at children's full development, i.e., their general intelligence [31]. An example is the free games or activities such as preparing recipes, in which children develop autonomy, practice creativity, and learn about transformation processes, new movements, words and meanings, such as colors and numbers.

The experiences, in general, encourage autonomy, curiosity and creativity, sharing, living the present, and sustainability and involvement with the food system.

Autonomy

From the moment children arrive, their autonomy is observed: they keep their own shoes in the chest and their other belongings in the locker, without adults helping.

Children move freely through the space, being able to handle objects and explore the environment. Educators keep observing, interfering only if necessary, so that children can seek solutions to their conflicts on their own. Autonomy is also encouraged when children participate in small tasks to keep the place in order and take care of each other (especially the elders and the youngest).

Usually, a child is the helper of the day and assembles the fruit dishes that are served during snack time. In culinary activities, children really participate in the process, developing autonomy. Furthermore, during snack time, children eat without help from adults and each one decides for themselves whether they want to eat or not, without being forced to eat a food they do not want.

Sometimes, even if they choose not to eat a fruit, children ask to take it to their parents, and educator comments: “[*They*] realize the value [of food], they realize that for everyone it has a value, realize that there are others who like it too. They take it to the person they love the most”.

Curiosity and creativity

Throughout all experiences, educators use playful references, mainly from fairy tales and Brazilian folklore, for different communication intentions, for instance: “*The dragon will blow fire*” (for warnings) or “*Who could have brought this magic powder for papaya?*” (to say it is delicious), among other uses. Language with playful elements encourages the exercise of fantasy and catches children’s attention, who often also use playful vocabulary.

Creativity is stimulated in several activities, from free games (creation of plots, characters, interactions) to activities related to eating, such as the setting up of the dishes by the helper of the day (which even increases the children’s enthusiasm for eating fruit) and creative ways of eating (one day, for example, the children put a piece of banana on top of a piece of apple and said it was a little boat to eat).

Frequently, children are introduced to new foods. Educators show enthusiasm and tell stories about this food, arousing children’s curiosity. When preparing recipes, children are also curious about the ingredients, the transformation processes, and the result of the preparation (they show interest in experimenting). Likewise, in the backyard, they are curious about the land, plants, food, and their respective cultivating processes. At snack time, curiosity is encouraged while educators suggest that the senses are experienced: visual, olfactory, tactile, and gustatory.

Such an incentive to curiosity demonstrates the recognition of the blind spots of knowledge and a search for relevant knowledge, i.e., it is assumed that there is always more to learn, and curiosity is the starting point for this. While creativity and curiosity increase children’s appreciation and interest in food and the act of eating, they can be important to FNE [31].

Sharing

Children live together throughout all experiences. They are encouraged to share toys, food and moments, without competition. Thus, they can understand their human condition they are unique, but belong to a society and species and have to be responsible and supportive of each other for a good living [31].

Like snack time, everyone receives the same fruit (equality), shared (solidarity) and treated with care (responsibility). They respect the meal time, the food and the hunger of others, exercising empathy for understanding, which is also observed when one helps the other voluntarily in a recipe preparation (joint construction), in sharing food (shared eating) and in respect to others' will and limits [31].

Living the present

Against anxiety and immediacy, activities are performed one at a time and children are encouraged to fully experience each of them, which became clear when a child, during the experience of colors, asked what activity would be performed next and the educator replied, "*I don't know, now it's time to draw*".

Before children arrive, educators perform an anthroposophical ritual, preparing themselves mentally and spiritually to receive them (state of presence and openness). Educators also adopt meditation, performed with children when they are uneasy or before snack time.

Snack time represents a ritual that include: the organization of tables and chairs; a simulation of a little train (that children do to go and wash their hands before a meal, walking in a line, holding the child in front of them by the shoulders with their hands and facing their backs); thanks to nature before eating; and shared eating. Foods are considered sacred, being respected and not treated as objects, which was elucidated when a child threw a piece of fruit on the floor and an educator said, "*This is called food, and food must not fall on the floor!*".

Educators encourage children to eat calmly, without fuss, experiencing the senses. While eating, children and educators interact with each other and talk about food, encouraging the state of presence to eat. In general, the ritualization of snack time helps to value the meal and makes this moment a positive experience for children, which can be a FNE strategy.

Encouragement to live the present is important for relevant knowledge, as it allows each activity to be fully experienced, enabling broader and more meaningful understanding than automatic experiences. Moreover, this issue refers to the human condition, since it transcends the physical characteristic and involves social, psychological and spiritual dimensions of human life [31].

Sustainability and involvement with the food system

The food system is understood while children participate in the processes of planting, cultivating, harvesting and consuming food (with respect and gratitude), and the destination of what was not eaten (composting). Thus, children understand that, before it is ready for consumption, food demands care and time, and that inedible parts (which are usually thrown away) can be useful as organic material to help plants grow. These processes support children's involvement with the food system, the valorization of food and the notion of sustainability, which is important for FNE.

Sense of belonging to the planet and the responsibility to take care of it (Earth identity) are also reinforced during activities in backyard, involving contact with the land and encouraging children to be kind to plants, thank for food, and respect nature, as they sing: "*The Earth is our mother, we must take care of it*" [31].

Affection and respect are also observed in the relationship of children with domestic animals in the space. The good relations between the living beings in an environment is the basis of symbiosophy (wisdom of living together), and the feeling of responsibility and solidarity with the Earth and other living beings constitutes the anthropo-ethics [31].

DISCUSSION

Data interpretations showed that the elements observed in the present study for developing FNE are integrated into the educational space's pedagogical concepts and are promoted through activities that address the environment, human relationships and ethical principles such as sharing and respecting; therefore, they are purposeful activities that can help to promote sustainable diet in a broad sense [54]. In the light of Complex Thought, this approach reveals the implementation of FNE as a systemic and not fragmented process, which, through a holistic approach, is inserted in the context of children's lives and contemplates the Seven Complex Lessons in Education for the Future [29-31].

The method adaptation according to children's observation and feedback between educators and families, inspired by Pikler approach, highlighting attentive observation as essential to education [42,45]. It assumes that knowledge can always be incomplete, hence the need to go beyond theoretical assumptions, as described by Morin [31]. Moreover, according to Goldshmidt [55], the constant practice of feedback added to the theoretical deepening and the exercise of meditation is essential for educators' emotional development so that they can exercise the role of encouraging the children's souls.

Education in this non-formal learning space is inspired in the theoretical frameworks mentioned, in the observations made and in the life orientations of the educators themselves, which, due to the principle of transparency and sincerity, is revealed in the experiences. Educators' personal values linking to the education offered can be a motivating factor for them, as they act according to what they actually believe. According to Mita, Li, and Goodell [56], educators' motivation and their own behaviors towards food are fundamental aspects to encourage good nutrition in children, which is also observable in the context of the present study, where educators and children share experiences, including those related to food, learning from each other. By showing interest and enthusiasm for new foods, educators motivate children to try them, encouraging imagination and exploration of the senses.

Several skills are worked on simultaneously, aiming at children's full development, suggested by Pikler approach and by anthroposophy, which propose an interconnected approach of physical, spiritual, emotional, and psychological aspects, under a holistic view of the human being [37,55]. Thus, the activities contemplate the development of a general intelligence, which favors the further development of specific skills [31]. Human beings' full development is considered relevant not only for early childhood education, but for education in general, as argued by Arruda, Andrade and Portal [57] when dealing with education for wholeness.

Encouragement to autonomy occurs all the time, based on anthroposophy and Pikler approach, highlighting the importance of autonomy for food choices (without being forced by an adult), which is also suggested by Slow Food movement when prioritizing individual freedoms [36,37,39,41-44]. Autonomy in relation to food is recommended by FNE guidelines [58,59]. And, according to Vaughn *et al.* [60] and Loth

et al. [61], it is important for children and consists of their involvement with food choices and food-related issues, processes evidenced in the educational environment focused on this research.

During snack time, children and educators sit at the table, which is a positive attitude towards food [62,63]. For instance, a study by Wansink and Kleef [64] showed lower Body Mass Indexes (BMI) among parents and children of families who had dinner daily sitting at the table in relation to families who ate in other places, highlighting the act of sitting at the table as a practice of social support and family involvement being a possible strategy to fight obesity.

Eating in a shared, peaceful and distraction-free way, exercising the skills of sharing and living the present, is also recommended by anthroposophy and by the Food Guide for the Brazilian Population and is related to the pleasure of food proposed by the Slow Food movement [35,41,59]. Additionally, practices such as simulating a little train (that children do to go and wash their hands before the meal) and thanking before eating ritualizes the moment of meal, as suggested by anthroposophy [36]. These ritual elements are symbolic and affective, helping to give new meaning to meals, considering food sacred, and the act of eating reveals broader values and meanings than automatic routine movements [65].

Social and cultural aspects strengthen the added value of food, as highlighted in a study by Bone, which deals with three educational spaces, including one based on anthroposophy [66,67]. In this case, children participate daily in the preparation and shared consumption of bread. Even if their parents prepare the same recipe at home, children report that bread tastes better at school, revealing that the food's value goes beyond their sensory characteristics. Bone [67] also points out the meal time as important to characterize daily rhythms (like snack time in the learning space focused on in this study), which, according to the Pikler approach, favors the children's awareness of time and space [42-44].

By participating in activities related to food cultivation and preparation, and the disposal of waste for composting, children are involved with the food system. In this regard, they can understand about life cycles, sustainability, and the value of food. The development of this awareness, which links concepts of health, society and sustainability, is encouraged by documents about FNE and by recent publications, considering this awareness and the consequent change in the society's attitude as essential to enable the world to sustain itself for this and future generations, since there are countless environmental impacts resulting from the current food production system [9,10,14-16,54,58,59,68]. In this context, the Society for Nutrition Education and Behavior took a stand, arguing that all dietary guidance, whether individual or in groups, should address issues related to environmental sustainability [68].

The educational approach focused on in this study contemplates children and their relationships with the world in a comprehensive and interconnected way, as proposed by Morin [31], highlighting their full development, the notion of belonging and respect for the planet and ideals of understanding, social responsibility, ethics and sustainability. These questions (such as the integration of the sustainability theme into educational approaches) are also addressed in the Sustainable Development Goals, proposed by the United Nations [69].

Based on the present case study, it is recommended that the development of FNE practices be integrated into pedagogical activities for children, with transparency and flexibility of educators, who must articulate activities aimed at the integral development of the child and involving the theme of food, encouraging elements such as autonomy, curiosity and creativity, sharing, living in the present and sustainability and involvement with the food system. These elements, as detailed in the previous paragraphs, have their importance recognized for the FNE by several publications [14-16,58-61,66,68,69].

The limitation of this research is that, as it is a case study, it considers a particular reality. Descriptive studies of others formal or non-formal educational spaces with holistic approach could corroborate the findings of the present research. Furthermore, comparative studies between holistic approach and other pedagogical approaches could enrich the evidence about the benefits or not of holistic education, as suggested by Miseliunaite, Kliziene and Cibulskas [70] when addressing the challenges of measuring whether holistic approaches are really more promising than traditional educational approaches.

CONCLUSION

This study revealed the potential of holistic approach to promote FNE, through the articulation of stimuli to autonomy, creativity and curiosity, sharing, living the present, and sustainability and involvement with the food system. Such attributes include the Seven Complex Lessons in Education for the Future and contextualize FNE in the principles of people's lives, in order to consider the complexity of education, food, and human beings.

Considering the above, it is considered important that holistic education approaches, involving FNE, are disseminated through public and private education system, to support the formation of human beings that are committed and conscious about themselves and their individual and collective responsibilities in relation to other living beings and the planet, which encompasses the food issue. To implement a holistic and complex educational approach in other contexts, more than the physical structure of educational spaces, the importance of training professionals in the education sector is highlighted, because they need to incorporate a vision that supports a comprehensive, interconnected and non-fragmented educational approach.

In order to deepen the studies on this theme, future investigations could follow the development over the years of the children who participated in holistic educational activities as well as explore the children's family context.

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CONTRIBUTORS

N SILVA REGO and RW DIEZ-GARCIA participated in the study conception, design, and following of the study. N SILVA REGO performed data collection and article writing. All authors participated in data interpretation. N RAVAGNOLI offered support in relation to Complex Thought. RW DIEZ-GARCIA and N RAVAGNOLI reviewed the manuscript.

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