

Child Participation and Experiential Learning in Food: A New Approach to Childhood Obesity

Partecipazione dei bambini e apprendimento esperienziale in campo alimentare: Un nuovo approccio all'obesità infantile

BENEDETTA FAEDI DURAMY
Professor of Law

Golden Gate University School of Law, San Francisco

Abstract

Child obesity is a major public health issue. Alarming obesity projections have sparked widespread concern, albeit not much consensus on how to address the problem. Obesity has been often viewed as a matter of personal responsibility, and especially of parental responsibility when it concerns children. Elsewhere, I discussed the importance of adopting instead a children's rights approach to hold governments accountable for preventing and combating child obesity. This article focuses instead on the right of children to participate in decision-making processes affecting their lives recognized under Article 12 of the Convention on the Rights of the Child. The article argues that its implementation through experiential food learning opportunities integrated into early childhood school curricula deserves much attention and holds some promise for effective solutions.

L'obesità infantile è un importante problema di salute pubblica. Le proiezioni allarmanti sull'obesità hanno suscitato una preoccupazione diffusa, anche se non c'è molto consenso su come affrontare il problema. L'obesità è stata spesso vista come una questione di responsabilità personale, e in particolare di responsabilità dei genitori quando si tratta di bambini. In altra sede, ho discusso dell'importanza di adottare un approccio basato sui diritti dei bambini per responsabilizzare i governi nella prevenzione e nella lotta all'obesità infantile. Questo articolo si concentra invece sul diritto dei bambini a partecipare ai processi decisionali che riguardano la loro vita, riconosciuto dall'articolo 12 della Convenzione sui diritti dell'infanzia. L'articolo sostiene che la sua attuazione attraverso opportunità di apprendimento esperienziale del cibo integrate nei programmi scolastici della prima infanzia merita molta attenzione e promette soluzioni efficaci.



Keywords: Child Obesity; Public Health; Sustainability; Comprehensive Approach.

Summary: [Introduction](#). – [1. Child Obesity](#). – [2. Legal Framework to Combat Child Obesity](#). – [2.1. State Obligations](#). – [2.2. Child Participation](#). – [3. Experiential Learning Approach](#). – [Conclusions](#).

Introduction.

Child obesity is a global public health issue. It affects about over 124 million children worldwide¹ and 13.7 million in the United States.² Alarming obesity projections have sparked widespread concern, albeit not much consensus on how to address the problem.

Obesity is often viewed as a matter of personal responsibility, and especially of parental responsibility when it concerns children. Elsewhere, I suggested the importance of adopting, instead, an international children's rights approach to hold governments accountable for preventing and combating child obesity. This article is a continuation of that effort. It focuses, in particular, on the right of children to participate in decision-making processes affecting their lives recognized under Article 12 of the Convention on the Rights of the Child (CRC). The paper argues that its implementation through experiential learning opportunities in food, integrated into school curricula, such as gardening programs, cooking classes and tasting sessions, deserves much attention and holds some promise for effective solutions.

Experiential learning theory suggests that students increase their understanding and learning through their own experiences. Empirical evidence shows that when children participate in gardening, cooking, and tasting activities they instinctively connect with food and nature through tactile and playful experiences, improving their imagination, observation and inquiry skills. They also develop a preference for healthy eating and learn how to care for plants and grow their own food. Student responses suggest that nutrition-related experiential components in school curricula are powerful and can positively influence children's future eating behaviors and attitudes towards food and the environment.

This article proceeds by discussing, first, the prevalence and consequences of child obesity. Second, it examines the relevant international legal framework both in terms of States positive obligations to address the issue and the right of children to participate in the decision-making processes affecting their

*Many thanks to the participants of the International Workshop "Design of rights for eco-food and eco-fertility: markets and casual relation" held at the Università degli Studi Suor Orsola Benincasa (Naples, Italy) on September 29, 2022; the Children and Law Workshop held at University of Connecticut Law School on March 31-April 1, 2022, and the Child Law and Rights Writers' Workshop held at University of South Carolina School of Law on November 5, 2021.

¹ World Health Organization (WHO), 'Obesity and Overweight' [2020], available at: <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>.

² Childhood Obesity, 'American Obesity Foundation', available at <https://americanobesityfdn.org/childhood-obesity/>.

adequate nutrition. Finally, by reviewing current empirical evidence and sharing insightful qualitative examples, the paper suggests an experiential learning approach to improve children's eating habits and preferences.

1. Child Obesity.

Child obesity is a serious public health concern. In 2019, the World Health Organization estimated that about 38 million children under the age of five were overweight or obese; and in 2016, over 340 million between the ages of 5 and 19 were overweight or obese.³ Child obesity rates have increased significantly in the past couple of years: lockdown measures, including school closures and restrictions on physical activities and movements, have forced children and adolescents to lead a more sedentary lifestyle than they did before the pandemic. A US study reported that, during the COVID-19 outbreak, adolescents increased their recreational screen time of almost 4 hours per day.⁴ The CDC also noted that during the pandemic the rate of Body Mass Index (BMI) increase almost doubled in American children aged 2–19 years.⁵ Data has shown that obesity and overweight are risk factors for ICU admission and severe COVID-19 outcomes.

A recent study found that in many countries obesity rates among children are rising faster than among adults.⁶ In the countries of the Organization for Economic Co-operation and Development (OECD), nearly one in six children are overweight or obese.⁷ In the United States, the percentage of obese children has more than tripled since the 1970s;⁸ and nearly 1 out of 3 children are currently overweight or obese.⁹ Based on these trends, researchers predict that almost 60% of today's American children will be obese by the age of 35.¹⁰ Once considered to be mostly prevalent in the Global North, overweight and obesity are now dramatically on the rise in the Global South too, particularly in urban settings, where the rate of increase of childhood overweight and obesity has been more than 30% higher than that of developed countries.¹¹ Many low- and middle-income nations are experiencing what has been defined as the *double burden* of malnutrition, characterized by the coexistence of undernutrition, overweight and obesity within the same household,

³ World Health Organization (WHO), 'Obesity and Overweight' [2020], (n 1).

⁴ JM Nagata, and others, 'Screen Time Use Among US Adolescents During the COVID-19 Pandemic Findings From the Adolescent Brain Cognitive Development ABCD', (2022) 176 I, JAMA Pediatric, 94-96

⁵ Child Obesity: a growing pandemic (2022) 10(1) The Lancet, 1 ff.

⁶ EW Gregg, JE Shaw, 'The Health Effects of Overweight and Obesity' (2017) 337, N Eng J Med 13-27, available at: <http://www.nejm.org/doi/full/10.1056/NEJMoa1614362#t=article>.

⁷ 'Obesity Update', [2017] OECD, available at <https://www.oecd.org/health/health-systems/Obesity-Update-2017.pdf>.

⁸ CD Fryar, MD Carroll, CL Ogden, 'Prevalence of overweight and obesity among children and adolescents: United States, 1963-1965 through 2011-2012' [2014] Atlanta, GA: National Center for Health Statistics, 1-6.

⁹ BE Siegel, Kid Food (1st edn, Oxford University Press, 2019) 123.

¹⁰ ZJ Ward, and others, 'Simulation of Growth Trajectories of Childhood Obesity into Adulthood', (2017) 22 N Eng J Med, 377.

¹¹ World Health Organization (WHO), Obesity and Overweight, [2020], (n 1).

community, or region.¹²

Obesity is considered to be the result of an energy imbalance between calories consumed and calorie expenditure. Excessive intake of energy-dense foods, which are high in fat and sugar, and insufficient physical activity are the most important factors affecting children's weight.¹³ Others include genetics, socio-economic status, and environmental and societal patterns associated with development as well as deficient and unequal policies related to food, health, agriculture, transportation, urban planning, marketing, and education. Pediatricians warn that unhealthy diets may not always translate into obesity. Fat stored closer to central organs rather than to the skin's surface can hide serious health problems under an apparently healthy weight.¹⁴

Obese and overweight children experience serious health issues. They have an increased risk of developing breathing problems, hypertension, and noncommunicable diseases like diabetes and cardiovascular conditions at a younger age.¹⁵ Other health problems include gallstones, sleep apnea, bowed legs, back problems, hirsutism, and menstrual irregularities.¹⁶ Obesity has been also associated with a greater risk of developing dementia¹⁷ and several types of cancer.¹⁸ Longitudinal studies have shown that obese children are more likely to remain obese throughout their life; and those who are not obese as adults still have a higher mortality rate compared to their peers who were not obese in childhood.¹⁹

Obesity and overweight don't harm children only physically but also psychologically and emotionally. Obese children are more likely to struggle with depression, anxiety, and low self-esteem that can persist into adolescence and even into adulthood.²⁰ Studies show that obese children have a similar psychological well-being and quality of life to those who have been diagnosed with a life-threatening disease like cancer.²¹ Socially, they are more likely to be excluded and stigmatized by their peers since nursery school and to be bullied, rejected, and discriminated against even more than children who experience bias due to race, age, or gender.²² Studies report that obese children are more

¹² World Health Organization (WHO), 'The Double Burden of Malnutrition – Policy Brief' [2017], available at: <file:///C:/Users/bfaed/Downloads/WHO-NMH-NHD-17.3-eng.pdf>.

¹³ World Health Organization (WHO), 'Obesity and Overweight', [2020], (n 1).

¹⁴ BE Siegel, *Kid Food* (Oxford university press 2019) 123.

¹⁵ World Health Organization (WHO), 'Obesity and Overweight', [2020], (n 1).

¹⁶ A Must, RS Strauss, 'Risks and consequences of childhood and adolescent obesity' (1999) 23 *Int J Obes*.

¹⁷ See M Kivimaki, and others 'Body mass index and risk of dementia: Analysis of individual-level data from 1.3 million individuals' (2018) 14 (5) *Alzheimer's & Dementia*.

¹⁸ Nutritional Editorial Staff, 'Extra Pounds Means Extra Cancer Risk', [2019] *Nutrition Action*, available at <https://www.nutritionaction.com/daily/diet-and-weight-loss/extra-pounds-means-extra-cancer-risk/>.

¹⁹ A Must, 'Long term morbidity and mortality of overweight adolescents – a follow up of the Harvard Growth Study of 1922 to 1935' (1992) 327 *N Eng J Med*, 1350-1354. See also WH Dietz, 'Health Consequences of Obesity in Youth: Childhood Predictors of Adult Disease' (1998) 101 (3 Pt 2) *Pediatrics*, 518 - 525

²⁰ See M Van Geel, P Vedder, J Tanilon, 'Are overweight and obese youths more often bullied by their peers? A meta-analysis on the correlation between weight status and bullying' (2014) 38(10) *Int J Obes*. See also LI Griffiths, TJ Parsons, AJ Hill, 'Self-esteem and quality of life in obese children and adolescents: A systematic review' (2010) 5(4) *Int J Pediatric Obes*.

²¹ JB Schwimmer, TM Burwinkle, JW Varni, 'Health-related quality of life of severely obese children and adolescents' (2003) 289(14) *JAMA*, 1813.

²² CO Jenson, CC Cushing, AR Elledge, 'Association between teasing, quality of life, and physical activity among preadolescent children', (2014) 39 *J Pediatr Psychol*, 39. See also R Puhl, 'Obesity stigma-causes,

likely to be stereotyped as lazy, disruptive and less intelligent;²³ and in physical education classes are often chosen on teams at last.²⁴

Poor diets can also affect children's learning and behaviors. Researchers have highlighted the correlation between healthy eating and academic performance. A 2008 Canadian study surveying 5200 5th graders and their parents found that students with a poor-quality diet were significantly less likely to perform well on the assessment.²⁵ Consumption of healthy nutrients have been reported to support cognitive processes, whereas diets that are high in fat and sugar undermine mental capabilities and increase the risk of neurological dysfunction²⁶, especially during adolescence.²⁷ Poor quality food compromises children's brain development and limits its potential²⁸, but can also affect their mood. Nutrient-poor foods, especially high-carb and high-sugar ones, stimulate hunger during school and trigger cravings and addiction.

Families' dietary choices play an important role on children's risk of obesity as well as on their food habits and preferences, which can last well into adulthood. The food that families buy and keep at home as well as the way family members eat their meals influence calorie intake in children. Recent studies have found that children eat more vegetables, fruits and other healthy foods when they are available at home²⁹ and when families eat their meals together.³⁰ Some studies have suggested also a correlation between frequency of family meals and children's lower body weight status.³¹ However, vegetables, fruits and whole grains are significantly more expensive than less healthy options, like refined grains and sweets, and are often unaffordable for lower income families.³² The Canadian study mentioned above found that children from socioeconomically advantaged families were eating healthier,

effects and some practical solutions' (2009) 54(1) *Diabetes Voice*; S Solavay, *Tipping the scales of justice: Fighting weight-based discrimination*, (Amherst NY: Prometheus, 2000).

²³ RR Friedman, R Puhl, 'Weight Bias: A Social Injustice Issue. A policy Brief' [2012] Yale Rudd Center for Food Policy & Obesity, available at https://media.ruddcenter.uconn.edu/PDFs/Rudd_Policy_Brief_Weight_Bias.pdf

²⁴ D Rhode, *The Beauty Bias: The Injustice of Appearance in Life and Law*, (Oxford University Press 2010).

²⁵ MD Florence, M Asbridge, PJ Veugelers, 'Diet Quality and Academic Performance' (2008) 78(4) *Journal of School Health*.

²⁶ F Gomez-Pinilla, 'Brain Foods: The Effects of Nutrients on Brain Functions' (2008) 9(7) *Nature Reviews Neuroscience*.

²⁷ A Reichelt, 'Adolescent Maturational Transitions in the Prefrontal Cortex and Dopamine Signaling as a Risk Factor for the Development of Obesity and High Fat/High Sugar Diet Induced Cognitive Deficits' (2016) 10 *Frontiers in Behavioral Neuroscience*, 189 ff.

²⁸ Barilla Center for Food and Nutrition, 'Unhealthy Food Goes to Your Head' [2016], available at <https://www.barillacfn.com/en/magazine/food-and-health/unhealthy-food-goes-to-your-head/>.

²⁹ R Jago, T Baranowski, JC Baranowski, 'Fruit and vegetable availability: a micro environmental mediating variable?' (2007) 10(7) *Public Health Nutrition*, 681-689.

³⁰ AJ Hammons, BH Fiese, 'Is Frequency of Shared Family Meals Related to the Nutritional Health of Children and Adolescents?' (2011) 127(6) *Pediatrics*, e1565-e1574. See also CC Delistraty, 'The Importance of Eating Together' [2014] *The Atlantic*, available at <https://www.theatlantic.com/health/archive/2014/07/the-importance-of-eating-together/374256/>; NI Larson, D Neumark-Sztainer, PJ Jannan, M Story, 'Family meals during adolescence are associated with higher diet quality and healthful meal patterns during young adulthood' (2007) 107 *Journal of American Diet Association*, 1502.

³¹ B Sen, 'Frequency of family dinner and adolescent body weight status: evidence from the national longitudinal survey of youth 1997' (2012) 14 (12) *Obesity*, 2266 ff.

³² GK Singh, M Siahpush, RA Hiatt, LR Timsina, 'Dramatic Increases in Obesity and Overweight Prevalence and Body Mass Index Among Ethnic-Immigrant and Social Class Groups in the United States, 1976-2008' (2011) 36(1) *JCommunity Health*, 94-110. See also N Darmon, A Drewnowski, 'Does social class predict diet quality?' (2008) 87(5) *Am J Clin Nutr*, 1107-17.

attending better schools and performing better academically.³³

Preparing healthy meals is also expensive and time consuming. Women's increased participation in the workforce has meant that more meals are pre-made, purchased and consumed away from home.³⁴ Such meals tend to be less healthful than those homemade and shared among family members. In the United States, for instance, families spend about half of their food budget and consume one-third of their daily calorie intake on meals prepared away from home.³⁵ Low-income working families and especially single parents, who have even less time for meals preparation, often end up buying convenience foods or fast foods.³⁶

Low-income families have also four times more access to unhealthy food options than wealthy families because often they live in neighborhoods with fewer supermarkets and a high concentration of convenience stores and fast-food restaurants, which is associated with lower quality diets and increased risk of obesity.³⁷ Convenience stores and fast-food restaurants are not only more likely to be located in poor neighborhoods, but also in proximity of schools.³⁸ Studies have found that close proximity of fast-food restaurants to schools is associated with increased risk of obesity in schoolchildren.³⁹ Convenience store snacks and sweetened beverages are also available for purchase in schools; their consumption has been linked to increased risk of obesity and diabetes.⁴⁰

Researchers argue that many parents refuse to acknowledge that their children are overweight, thus failing to make the dietary and lifestyle changes that are necessary to prevent them from becoming obese.⁴¹ Parental obesity as well as cultural beliefs that consider "chubby" children as healthy and cute

³³ MD Florence, M Asbridge, PJ Veugeliers, 'Diet Quality and Academic Performance' (2008) 78 (4) J Sch Health, 209-15.

³⁴ DN Cutler, and others, 'Why Americans Become More Obese?' (2003) 17(93) Journal of Economic Perspectives, 105-107. See also JF Guthrie, and others, 'Road of Food Prepared Away From Home in the American Diet, 1977-78 Versus 1994-1996, Changes and Consequences' (2002) 34(3) J Nutr Educ Behav, 140-150; JM Poti, BM Popkin, 'Trends in Energy Intake Among U.S. Children By Eating Location and Food Source, 1997-2006' (2011) 111(8), J Am Diet Ass, 1156-1164.

³⁵ MA McCann, 'Economic Efficiency and Consumer Choice Theory in Nutritional Labeling' [2004] Wi L Rev, 1161-1244.

³⁶ N Darmon, A Drewnowski, 'Does social class predict diet quality?' (32).

³⁷ SN Zenk, and others, 'Neighborhood retail food environment and fruit and vegetable intake in a multiethnic urban population' (2009) 23(4) Am J Health Promot, 255-64. See also LM Powell and others 'Associations between access to food stores and adolescent body mass index' (2007) 33(4), Am J Prev Med, S301-7.

³⁸ SN Zenk, LM Powell, 'US secondary schools and food outlets' (2008) 14(2), Health Place, 336-46. See also R Sturm, 'Disparities in the food environment surrounding US middle and high schools' (2008) 122(7), Public Health, 681-90.

³⁹ SB Austin, and others, 'Clustering of fast-food restaurants around schools: a novel application of spatial statistics to the study of food environments' (2005) 95(9) Am J Public Health, 1575-81. See also B Davis, C Carpenter, 'Proximity of fast-food restaurants to schools and adolescent obesity' (2009) 99(3), Am J Public Health, 505-10; and G Anand, 'One Man's Stand Against Junk Food as Diabetes Climbs Across India', The New York Times, (December 26 2017), available at: <https://www.nytimes.com/2017/12/26/health/india-diabetes-junk-food.html>.

⁴⁰ DM Finkelstein, EL Hill, RC Whitaker, 'School food environments and policies in US public schools' (2008) 122(1), Pediatrics, 251-9. See also NI Larson, M Story, 'Are 'competitive foods' sold at school making our children fat?' (2010) 29(3) Health Aff, 430-5.

⁴¹ KJ Gruber, LA Haldeman, 'Using the Family to Combat Childhood and Adult Obesity' (2009) 6(3) Prev Chronic Dis, A106.

are often the cause of parents' oversight, especially for boys.⁴² Pediatricians are also responsible for failing to flag children's excess weight gain during routine appointments due to lack of time, fear of raising a sensitive issue,⁴³ or showing cultural insensitivity.

2. Legal Framework to Combat Child Obesity.

This section summarizes the positive obligations that States have to ensure children's best interest in relation to nutritionally adequate food under both international law and domestic rules. It also examines the concept of child participation under the Convention on the Rights of Child (CRC) and its interpretation in the children's rights literature.

2.1 State Obligations.

The issue of obesity has been mostly approached as a matter of personal responsibility, or in the case of children, as a matter of parental responsibility. However, children have a limited ability to control their diets because they do not purchase their own food, they may not be able to prepare meals for themselves and their families, and they do not have a full understanding of the long-term health consequences of their eating habits. By the same token, as previously discussed in this paper, parents may not always be able to determine what will serve their children's best interest when it comes to food choices and eating patterns.

Secondary to parental obligation, States bear the responsibility to intervene for the protection and care of children as a measure of last resort, whenever their health and wellbeing may be at serious risk, as determined by a competent authority. For example, in multiple cases of severe obesity both in the United States and in the United Kingdom, children have been removed from their families by social services because their excessive weight raised major concerns

⁴² SM Martinez, and others, 'Latino mothers' beliefs about child weight and family health' (2017) 20(6) Public Health Nutr, 1099-1106. See also C Sirikulchayanonta, and others, 'Participatory action project in reducing childhood obesity in Thai primary schools' (2011) 23(6) Asia Pac J Public Health, 917-927.

⁴³ A Cockrell Skinner, 'Parental Recall of Doctor Communication of Weight Status' (2012) 166(4) Arch Pediatr Adolesc Med, 317-22. See also NH Golden, M Schneider, C Wood, 'Preventing Obesity and Eating Disorders in Adolescence' (2016) 138(3) Pediatrics.

for their health.⁴⁴ Scholars have argued that child obesity may amount to medical neglect and may require child protection services' intervention should parents fail to follow recommended treatments and dietary guidelines, and, particularly, if the following conditions are met: there is a high risk of serious imminent harm, there is a reasonable likelihood that State intervention will result in effective treatment, and, finally, all alternative options have been exhausted.⁴⁵

States positive obligation to ensure children's best interest in relation to nutritionally adequate food has been recognized under international law. States parties to the International Covenant on Economic, Social and Cultural Rights (ICESCR), including the United States, are responsible to take steps to achieve progressively, but as expeditiously as possible, the full realization of the right to adequate food.⁴⁶ To this end, each State must secure that everyone has access to food that is sufficient, and nutritionally adequate and safe. More specifically, the right to adequate food imposes the positive obligation on States to ensure that third parties, including individuals, enterprises and other entities, do not infringe upon the realization of such right.⁴⁷

The CRC, that recognizes children as holders of their own rights, still assigns parents the primary responsibility for their children's upbringing and development.⁴⁸ The CRC holds, indeed, that the family is the fundamental group of society and the natural environment for children's growth and well-being and, thus, should be accorded with the necessary protection and assistance to be able to fulfill its responsibilities within the community.⁴⁹ According to Article 5, "States Parties shall respect the responsibilities, rights and duties of parents... to provide, in a manner consistent with the evolving capacities of the child, appropriate direction and guidance" in children's

⁴⁴ See *In re L.T.*, 494 N.W.2d 450 (Iowa Ct. App. 1992) holding that a ten-year-old girl suffering from morbid obesity, depression, and a personality disorder following the divorce of her parents was properly adjudicated a 'child in need of assistance' and that placement in a residential treatment foster care home was the least restrictive means available to address both her psychological and life-threatening physical problems. See *In re G.C.*, 66 S.W.3d 517 (Tex. App. 2002) holding the termination of parental rights for medical neglect of a morbidly obese four-year-old boy whose mother had failed to adhere to the recommended diet for him. See *In re Brittany T.*, 835 N.Y.S.2d 829 (N.Y. Fam. Ct. 2007), rev'd 852 N.Y.S.2d 475 (N.Y. App. Div. 2008), in which the family court found the parents guilty of willfully violating court orders to, inter alia, keep the child on a diet, to get nutritional counseling, to enroll child in gym, and to take all actions necessary to ensure the child attend school more regularly. The court ordered the child to be removed to foster care. On appeal, the court reversed the family court's order because it determined that the Chemung County Department of Social Services had not proved "willful violation" of the family court orders by the parents and instead found that the parents had been trying to comply. For a discussion of these cases, see L. Dominguez, 'Childhood Obesity As Child Abuse: Criminalizing Parents For Raising Obese Children' (2014) 2(1), *Child and Family Law Journal*, 105-122; and D Cohen, 'Childhood Obesity: Balancing the Nations' Interest with a Parent's Constitutional Right to Privacy' (2012) 10 *Cardozo Public Law Policy & Ethics Journal*, 357-374. Finally, see also *Obese Children Removed from Their Families*, *The Telegraph*, 28 Feb, 2014, discussing children put into care in the UK because of their morbid obesity, available at <https://www.telegraph.co.uk/foodanddrink/healthyating/10667066/Obese-children-removed-from-families.html>.

⁴⁵ T Varness, BD Allen, AL Carrel, and others, 'Childhood Obesity and Medical Neglect' (2009) 123(1) *Pediatrics*, 399-406; RM Viner, E Roche, SA Maguire, and others, 'When does childhood obesity become a child protection issue?' (2010) 341 *BMJ*, 7769.

⁴⁶ See ICESCR Article 2; see also ICESCR Committee, General Comment No. 3.

⁴⁷ *Ibid.*

⁴⁸ CRC, art. 18(1).

⁴⁹ *Ibid.*, at Preamble.

exercise and enjoyment of the rights recognized under the CRC.⁵⁰ This means that parents bear indeed the primary responsibility, among others, to provide their children with adequate nutritious food and health.

Nevertheless, the State must afford children the protection and care that are necessary for their well-being.⁵¹ In cases of child neglect or abuse, for example, Article 19 of the CRC requires States to “take all appropriate legislative, administrative, social and educational measures to protect the child from all forms of physical or mental violence, injury or abuse, neglect or negligent treatment, maltreatment or exploitation, including sexual abuse, while in the care of parent(s)...,” thereby suggesting that parental rights may be conditional and subject to limitations whenever this may be in the child’s best interest.⁵² This means that, despite the primary role of parents and the State’s obligation to support them, the paramount principle under the CRC is that “in all actions concerning children, the best interest of the child shall be a primary consideration.”⁵³

In particular, General Comment No.7 to the CRC on Implementing Child Rights in Early Childhood, issued by the Committee on the Rights of the Child in 2005, requires States parties to ensure that children have access to good nutrition, which is essential for their wellbeing and development.⁵⁴ Obesity and unhealthy lifestyles have long-term impacts not only on children’s physical health, but also on their mental state and ability to learn, socially participate, and realize their potential. In practice, this implies that whenever children’s right to adequate food is violated, their right to education is also compromised. Under Article 29 of the CRC, States parties commit that the education of children should be directed to the development of their personality, talents, mental and physical abilities to their fullest potential as well as of the respect of the natural environment.⁵⁵ In other words, children’s right to adequate food and their right to education are interdependent and interrelated as much as States’ obligations to protect them and fulfill them.

Even in the United States, that did not ratify the CRC, and thus may not be bound by its obligations, governments are considered responsible to secure children’s best interest through the application of the *parens patriae* doctrine whenever parents or families are failing to meet their primary obligations.⁵⁶ The *parens patriae* doctrine has its roots in English Common Law when rights and duties were ultimately reserved to the King as parent of the country. Lately, its main application has been in the treatment of minors, insane or otherwise incapacitated people, who are legally unable to act for themselves. The government serves as their ultimate guardian to protect their best interest and their property. Legal scholars have recently argued that [the Legislature’s]

⁵⁰ Ibid art.5.

⁵¹ Ibid art.3(2).

⁵² Ibid art.19(1).

⁵³ Ibid art. 3(1); M Freeman, Article 3: The Best Interests of the Child [2007] 53-56; J Tobin, ‘Beyond the Supermarket Shelf: Using a Rights-Based Approach to Address Children’s Health Needs’ (2006) 14(3) International Journal of Children’s Rights, 275-306; M Woolf, ‘Coming of age? – the principle of the “best interests of the child” [2003] 2 European Human Rights Law Review, 205-210.

⁵⁴ https://www.unicef-irc.org/portfolios/general_comments/GC7.Rev.1_en.doc.html

⁵⁵ Art. 29 CRC.

⁵⁶ L Kaplin, ‘A National Strategy to Combat the Childhood Obesity Epidemic’ (2011) 15(2), U.C. Davis Journal of Juvenile Law & Policy, 345-398.

“paternalistic vigilance” should also be extended to secure adequate protection to all children from the “obesity epidemic.”⁵⁷

2.2 Child Participation.

The meaning of participation can vary significantly depending on the context. The term is defined in the dictionary as to “take part or become involved in something.”⁵⁸ In ordinary language, participation can be broadly described as the act of engaging with others; but in the context of children’s rights, participation means the process of taking part in an activity and, specifically, in decision-making.⁵⁹ The concept of child participation was first legally framed under Article 12 of the CRC, which is often considered as the “heart of the participatory articles”⁶⁰ and “contributes widely to the success of the CRC”.⁶¹ Paragraph 1 of the provision sets forth the right of children, who are capable of forming their own views, to express them freely in all matters affecting their lives; and it ensures that such views are accorded due weight in accordance with the age and maturity of the children.

In an attempt to clarify the practice and term *participation*, which does not appear in the provision above, General Comment No. 12 to the CRC of the Committee on the Rights of the Child (General Comment) elaborated that it entails “ongoing processes, which include information-sharing and dialogue between children and adults based on mutual respect, and in which children can learn how their views and those of adults are taken into account and shape the outcome of such processes.”⁶² This definition expands the notion of child participation to include both the process and the outcome, with the three key components of mutual respect between children and adults, joint learning process, and recognition of an impact in shaping the outcome.⁶³ The General Comment emphasizes that children’s views should be sought and listened to when children express them both as an individual and as a group. Recognizing that the participatory process can influence decision-making and bring about change does not mean that children’s contributions or opinions are determinants of outcome, but that they must be weighted seriously and may be acted upon.⁶⁴

Over the past three decades, scholars, advocates, practitioners, and

⁵⁷ Ibid, also discussing the *Mangini v. R.J. Reynolds Tobacco*, 875 P.2d 73, 83 (Cal. 1994), when anti-smoking advocates brought suit against R.J. Reynolds challenging the Joe Camel advertising campaign targeting children in the 1990s, the California Supreme Court referred to the *parens patriae* doctrine in dismissing a summary judgment challenge.

⁵⁸ 3rd edn Cambridge Advanced Learners’s Dictionary.

⁵⁹ R Thorburn Stern, *Implementing Article 12 of the UN Convention on the Rights of the Child* (Brill 2017).

⁶⁰ MG Flekkøy, NH Kaufman, *The Participation Rights of the Child. Rights and Responsibilities in Family and Society* (London: Jessica Kingsley 1997).

⁶¹ MF Lückner-Babel, ‘The right of the child to express views and to be heard: An attempt to interpret Article 12 of the Convention on the Rights of the Child’ (1995) 3(3-4) *International Journal of Children’s Rights*, 391–404.

⁶² UN Committee on the Rights of the Child, General Comment No. 12 on The right of the child to be heard, CRC/C/GC/12 (2009).

⁶³ EKM Tisdall, *Children Should Be Seen and Heard? Children and Young People’s Participation in the UK, Children and Young People’s Participation and Its Transformative Potential: Learning from across countries* (Palgrave Macmillan: Basingstoke 2014), 168–188.

⁶⁴ J Boyden, J Ennew, *Children in Focus: A Manual for Participatory Research with Children* (Radda Barnen: Stockholm 1997).

legislators have devoted significant attention to the interpretation of children's right to participation, particularly, under Article 12 of the CRC. The notion is very broad and may refer to different practices, including children taking part in activities initiated and facilitated by adults, children being consulted by adults during the process, and children partaking in decision-making. Hart adapted Arnstein's ladder of citizen participation⁶⁵ to child participation designing an eight-rungs ladder to illustrate that there are significant gradations of children's involvement in decision-making.⁶⁶ The three lowest rungs are classified as nonparticipation because children are "manipulated," "decorated," or "tokenized" by adults. The following five rungs entail varying degrees of involvement and responsibility ranging from "assigning and informing children," "consulting and informing children," "adult initiated, shared decisions", "child-initiated and directed", up to "child-initiated, shared decisions." Despite being probably the most influential typology of child participation, Hart's model has been criticized for its hierarchical structure.

Treseder removed the three nonparticipation categories of Hart's ladder and placed the remaining five in a circle, emphasizing that each degree of participation has equal standing with the others.⁶⁷ Nevertheless, scholars have ascribed to both these typologies the risk of being static and immune to change over time⁶⁸ as well as the liability of reifying barriers between adults and children and social constructions of childhood versus adulthood.⁶⁹ Shier's alternative model, instead, is based on five levels of participation, ranging from "listening to children," "supporting children in expressing their views," "taking children's views into account," "involving children in decision-making processes," up to "sharing power and responsibility for decision-making with children."⁷⁰ Although Shier's model presents a hierarchical structure like Hart's ladder, it identifies, at each level of participation, what adults and organizations need to do to involve children in the process by performing the following stages: openings, opportunities and obligations.

Lundy designed a model for conceptualizing Article 12, which captures its two elements of children's right to express their own views and their right to have such views given due weight.⁷¹ Her typology emphasizes "the indivisibility, interdependence and interconnectedness of all human rights"⁷² and, hence, the importance of reading and interpreting Article 12 in conjunction with the other rights protected under the CRC. In particular, the following five

⁶⁵ SR Arnstein, 'A Ladder of Citizen Participation' [1969] AIP Journal, 216-224.

⁶⁶ RA Hart, 'Children's Participation: From tokenism to citizenship' [1992] Innocenti Essay no. 4, Florence: International Child Development Centre.

⁶⁷ P Treseder, *Empowering children and young people training manual: promoting involvement in decision-making* (London: Save the Children, UK 1997).

⁶⁸ A Cornwall, 'Unpacking 'Participation': models, meanings and practices' (2008) 43(3) *Community Development Journal*, 269-283. See also EKM Tisdall, *Children Should Be Seen and Heard?* (n 63), 168-188.

⁶⁹ L Shamgar-Handelman, 'To whom does childhood belong?' in J Qvortrup, M Bardy, G Sgritta, H Wintersberger (eds.) *Childhood Matters. Social Theory, Practice and Politics* (Aldershot: Avebury 1994). See also D Oswell, *The Agency of Children: From family to global human rights* (Cambridge: Cambridge University Press 2013).

⁷⁰ H Shier, 'Pathways to participation: openings, opportunities and obligations' (2001) 15(2) *Children & Society*, 107-117.

⁷¹ L Lundy, 'Voice is not enough: conceptualizing Article 12 of the United Nations Convention on the Rights of the Child' (2007) 33(6) *British Educational Research Journal*, 927-947.

⁷² *Ibid* 932.

obligations are interrelated to child participation: the principle of nondiscrimination (Article 2), the best interest of the child (Article 3), the right to information (Article 13), the right to guidance from adults (Article 5), and the right to be safe (Article 19). For the full realization of the principle of child participation, decision makers need to consider the following four factors and their relationship with the two elements of Article 12 and the five provisions above: Space, Voice, Audience, and Influence. Space entails that children must be given the opportunity to express a view. Voice means that children must be facilitated to express their views. Audience imposes the obligation that such views must be listened to. Influence implies that these views must be acted upon, as appropriate.

Children's participation in the decision-making processes affecting their adequate nutrition is grounded on Article 12 of the CRC. The Open-ended Working Group established by the Commission on Human Rights, which drafted the text of the CRC, intentionally provided that the right to be heard should be applied broadly to all matters affecting children's lives, thus including their nutritional well-being. For practical implementation, Article 12 should be interpreted in connection with Article 3 of the CRC (primary consideration of the best interests of the child), when applied to children's best interest in relation to their nutritional health. To achieve children's participation in the decisions related to their nutritional needs and healthy diet, both Articles 12 and 3 should be read also in connection with Article 5 of the CRC (evolving capacities of the child and appropriate direction and guidance from parents), since it is crucial that parents acknowledge children's evolving capacities to participate in all matters affecting them.

General Comment No 12 of 2009 specifically clarifies that the realization of the provisions of the CRC requires respect for children's right to participate in promoting their healthy development and well-being. Paragraph 98 states that this applies to individual health-care decisions, as well as to children's involvement in the development of health policy, programs and services. By extension, children's right to participation should be interpreted also to apply to decisions related to children's healthy nutrition and eating habits, which are indeed a crucial component of their optimal development and well-being. Children's involvement in the development and implementation of nutrition policies and measures is crucial to achieve effective programs and services that take into due consideration their perspectives and experiences and ensure their commitment as primary beneficiaries.

Similarly, under the ICESCR, the obligation to fulfil the right to adequate food requires States to inform people, including children, of such right to adequate food and increase their ability to participate in the development process of food and nutrition programs as well as related decision-making. In General Comment No. 14, the Committee on Economic Social and Cultural Rights (CESCR Committee) also provided that States must secure people's participation in the decision-making processes affecting their development; and that such participation must be an integral component of any policy, program or strategy developed for the realization of the right to the highest

attainable standard of health.⁷³ Particularly for children and adolescents, States must provide a safe and supportive environment that fosters their ability “to participate in decisions affecting their health, to build life skills, to acquire appropriate information, to receive counselling and to negotiate the health-behavior choices they make”.⁷⁴ In other words, only by adopting participatory and transparent processes that include children’s perspectives, in addition to those of other stakeholders, in the development and implementation of steps and measures designed to prevent obesity can States effectively fulfill their positive obligations to the realization of the rights to adequate food and to health for all children.

Participation is also one of the human rights principles under the PANTHER framework, developed by the Food and Agricultural Organization of the United Nations (FAO), that must be applied in the development and implementation of effective policies and programs related to adequate nutrition and food security.⁷⁵ According to such framework, all stakeholders and especially children, who are among the vulnerable groups most affected by lack of adequate food, must be given the choice to participate in the assessment, decision-making, implementation, and monitoring of measures, strategies, policies, and programs related to adequate nutrition. When it pertains to children, participatory processes must respect and take in due consideration their age and level of maturity to enable them to contribute to more effective outcomes.

Finally, the Special Rapporteur on the Right to Food reaffirmed that the principle of participation requires beneficiaries of nutrition-based measures to partake in the development and implementation of the solutions that can benefit them.⁷⁶ This means, for instance, that overweight and obese children should be included in designing nutrition, physical activity, and obesity prevention strategies and programs in collaboration with nutritionists, healthcare professionals, and teachers. Participatory processes not only benefit children because their perspectives as primary beneficiaries enhance the effectiveness of measures and interventions adopted, but also because children themselves are empowered by and throughout the process and, thus, become most committed in the success of the solutions proposed.

3. Experiential Learning Approach.

In the last decade, there has been growing awareness of the importance of fruit and vegetable consumption for human health and nutrition. An increased

⁷³ General Comment No. 14, CESCR Committee 2000, para. 54.

⁷⁴ *Ibid* para. 23.

⁷⁵ Food and Agric. Org. of the U.N., ‘The Right to Food: Making It Happen—Progress and Lessons Learned through Implementation’ 7 (2011), <http://www.fao.org/docrep/014/i2250e/i2250e.pdf>; See also Food and Agric. Org. of the U.N., ‘The Human Right to Adequate Food in the Global Strategic Framework for Food Security and Nutrition: A Global Consensus’ 14–15 (2013), <http://www.fao.org/3/a-i3546e.pdf>.

⁷⁶ Olivier De Schutter, Rep. of the Special Rapporteur on the Right of Food, 1–3, U.N. Doc. A/HRC/19/59, (Dec. 26, 2011), http://www.ohchr.org/Documents/HRBodies/HRCouncil/RegularSession/Session19/A-HRC-19-59_en.pdf. The United Nations Rapporteur on the Right to Food is an independent expert appointed by the Human Rights Council to examine, monitor, advise, and report on the realization of the right to food.

intake of fruits and vegetables is associated with a reduced risk of obesity, cardiovascular diseases, and diabetes.⁷⁷ Studies show that high fruit and vegetable consumption in childhood may also reduce the risk of developing certain types of cancer later in life.⁷⁸ Although such consumption generally tends to decline in adulthood, longitudinal studies found that eating recommended dietary guideline amounts in childhood positively influences healthy eating habits in adults.⁷⁹ Therefore, intervention on eating patterns and food preferences in children is more beneficial than attempting to change them later on in life.⁸⁰

Studies conducted in developed economies found that children's intake of vegetables and fruits is well below the recommended 5 servings per day.⁸¹ A multi-year cross-sectional investigation conducted from 1999 to 2016 by the National Health and Nutrition Examination Survey (NHANES) found that 52.5% of American children aged 6-11 years still had poor dietary quality in 2015–2016.⁸² In a food environment of easy access to cheap fast-food restaurants and palatable snacks that are high in fat, sugar, and salt, fruits and vegetables have become the least preferred types of food by children.⁸³

Teaching children the recommended skills for healthy eating, which include consuming a great variety of foods that are low in sugar, fat, and salt, and in particular fruits and vegetables is often the focus of specific clinical programs for the treatment of severe obese children in hospitals or specialized institutes. However, learning skills to improve eating habits and make healthy food and lifestyle choices is necessary for the wellbeing and development of all children and, therefore, should be an available option in their everyday environment. Elementary-aged children consume between one-third and one-half of their daily calories at school, making schools a key setting for promoting healthy behaviors and improving children's food preferences and eating patterns.⁸⁴

⁷⁷ Food and Agriculture Organization (FAO), [2004] 'Fruit and vegetables for health', FAO/WHO Workshop.

⁷⁸ M Maynard et al., 'Fruit, vegetables, and antioxidants in childhood and risk of adult cancer: The Boys Orr cohort' (2003) 57, *Journal of Epidemiology Community Health*, 218-225.

⁷⁹ N Lien et al., 'Stability in consumption of fruit, vegetables, and sugary foods in a cohort from age 14 to age 21' (2001) 33, *Preventive Medicine Journal*, 217-226. See also S H Kelder et al. 'Longitudinal tracking of adolescent smoking, physical activity, and food choice behaviors' (1994) 84, *American Journal of Public Health*, 1121, 1126; and S J te Velde et al. 'Tracking fruit and vegetable consumption from adolescence into adulthood and its longitudinal association with overweight' (2007) 98, *British Journal of Nutrition*, 431-438.

⁸⁰ S M Krebs-Smith et al., 'Psychological factors associated with fruit and vegetable consumption.' (2005) 10(2), *American Journal of Health Promotion*, 98-104.

⁸¹ J Gregory et al., 'National Diet and Nutrition Survey: Young People Aged 4-18 years' (2000) 1, Report of the Diet and Nutrition Survey, London: HMSO. See also R Wijesinha-Bettoni et al., 'Increasing fruit and vegetable consumption among schoolchildren: Efforts in middle-income countries.' (2013) 34, *Food and Nutrition Bulletin* 1-76.

⁸² J Liu, C D Rehm, J Onopa, D Mozaffarian, 'Trends in diet quality among youth in the United States, 1999–2016' (2020) 323, *JAMA*, 1161–1174.

⁸³ American Dietetic Association, 'Local support for nutrition integrity in schools.' (2000) 100, *JAND*, 108-111. See also P Gleason & C Sutor, 'Changes in Children's Diets 1989-91 to 1994-96.' (2000), Washington DC, United States Department of Agriculture; P Rozin, 'One-trial acquired likes and dislikes in humans: Disgust as a US food predominance, and negative learning predominance' (1986) 17, *Learning and Motivation*, 180-189; C D Rehm, A Drewnowski, 'Trends in consumption of solid fats, added sugars, sodium, sugar-sweetened beverages, and fruit from fast food restaurants and by fast food restaurant type among US children, 2003–2010.' (2016) 8, *Nutrients*, 804. 7. J L Thomson, L M Tussing-Humphreys, M H Goodman, A S Landry, 'Diet quality in a nationally representative sample of American children by sociodemographic characteristics.' (2019) 109, *Am. J. Clin. Nutr.*, 127–138.

⁸⁴ K W Cullen, T A Chen, 'The contribution of the USDA school breakfast and lunch program meals to student daily dietary intake.' (2017) 5, *Prev. Med. Rep.*, 82–85.

Empirical research has found that fostering the consumption of fruits and vegetables by children in primary schools is more effective to increase their intake than interventions targeting older children, who may be more reluctant to change their consumption patterns.⁸⁵ Several studies have suggested the importance of increasing the availability of nutritious foods in school meal programs.⁸⁶ Others, instead, have more recently explored the value of experiential learning activities related to food, such as school gardens, cooking programs, and taste lessons.⁸⁷ For example, a 2021 study conducted in the United States surveying eight primary schools found that school-based gardening, cooking, and nutrition interventions can result in significant improvements in students' dietary intake.⁸⁸ This paper joins such efforts in advocating for the implementation of experiential learning programs related to food to combat obesity and overweight in children as well as to fulfil their right to adequate nutrition and to actively participate in the process of achieving it.

Experiential learning has been defined as a "learning process whereby knowledge is created through the transformation of experience".⁸⁹ In other words, it is the process of "learning by doing", or, more specifically, of learning through hand-on experiences and reflection. It is characterized by a high level of active participation, in which students, according to their age, cognitively, emotionally, and behaviorally process knowledge, skills, and attitudes in a learning situation.⁹⁰ The full realization of such process engages learners in the following four stages: 1) concrete experiences; 2) reflective observations; 3) abstract conceptualizations; and 4) active experimentations.⁹¹ A specific concrete experience is created in the real world as an opportunity for learning. Learners make sense of this experience through reflective observations. Then, they identify the main takeaways, assimilate them into their existing knowledge, and, finally, experiment with them in further experiences.⁹² Bawden summarized the Experiential Learning process as follows:⁹³

⁸⁵ K Glanz, 'Progress in dietary behavior change.' (1999) Vol. 14 No. 2, *AJHP*, 112-117.

⁸⁶ K B Bevans et al. 'Children's eating behavior: the importance of nutrition standards for foods in schools.' (2011) 81, *Journal of School Health*, 424-429. See also P Ohri-Vachaspati et al. 'Fresh fruit and vegetable program participation in elementary schools in the United States and availability of fruits and vegetables in school lunch meals' (2012) 112, *JAND*, 921-926; J De Sa & K Lock, 'Will European agricultural policy for school fruit and vegetables improve public health? A review of school fruit and vegetables programmes.' (2008) 18, *EJPH*, 558-568.

⁸⁷ K Kaplan et al., 'Learning from the ground up: Experiential Learning in Food and Agriculture Systems Education at the University of California' (UC Global Food Initiative 2016). P DeCosta et al., 'Changing children's eating behaviour - A review of experimental research' (2017) Vol. 113, *Appetite*, 327-357.

⁸⁸ M J Landry et al., 'Impact of a School-Based Gardening, Cooking, Nutrition Intervention on Diet Intake and Quality: The TX Sprouts Randomized Controlled Trial' (2021) 13, *Nutrients*, 3081 ss.

⁸⁹ D A Kolb, *Experiential learning: Experience as a source of learning and development* (1st ed., Englewood Cliffs, 1984) 38.

⁹⁰ S Yardley, P W Teunissen, & T Dornan, 'Experiential learning: AMEE Guide No. 63.' (2012) 34, *Medical Teacher*, 102-2115.

⁹¹ DA Kolb, *Experiential Learning: Experience as the Source of Learning and Development* (2nd edn, Pearson FT Pr. 2014), 89.

⁹² M Knowles, *The modern practice of adult learning: From pedagogy to andragogy* (2nd ed. Cambridge Books 1980).

⁹³ JR Bawden, 'The Community Challenge: The Learning Response' (1998) 99, *New Horizons in Education*, 40-59.

'The process of learning starts with the immersion of the learner in a concrete experience from which as many observations as possible are gathered and perceptions recorded. This stage of information gathering is then followed by a phase of thinking, during which attempts are made to understand what has been experienced and sense is made out of what has been sensed! This stage is followed, in turn, with plans for action based on the understanding achieved. Finally, the planned action is taken, and as this changes the situation, the whole process is repeated, and more knowledge created.'

School gardens have been established to increase students' knowledge about nutrition, ecology and health as well as their intake of fruit and vegetables.⁹⁴ Benefits associated with garden-based nutrition education, have been empirically demonstrated. A study conducted on school gardens in Ontario, Canada, showed that: students who engage in garden-based learning about nutrition are more likely to eat a greater variety and number of fruits and vegetables, they engage in moderate and vigorous physical activity, and, finally, they develop positive attitudes towards the environment.⁹⁵ In particular, sixth-grade students involved in a garden-based nutrition education program more than doubled their overall fruit and vegetable consumption by increasing it of 2.5 servings per day.⁹⁶ Fourth-grade students who received garden-based nutrition education were more willing to try new vegetables than students who received nutrition education without gardening activities.⁹⁷ They also improved their knowledge of and preferences for fruits and vegetables.⁹⁸ Middle school students demonstrated improved attitudes toward fruits and vegetables and increased willingness to taste and eat a greater variety of vegetables.⁹⁹

In 2017, a review of gardening interventions found that 10 of the 14 studies considered showed significant increases in fruit and vegetable intake by the participants.¹⁰⁰ Similarly, a 2020 review of garden-based interventions in children ages 6 years and younger concluded that gardening activities are effective at improving nutrition-related outcomes, particularly fruit and vegetable consumption.¹⁰¹ An assessment of empirical studies focusing on gardening programs, that included cooking and tasting sessions, also found a

⁹⁴ AJ Nowak, G Kolouch, L Schneyer, & K H Roberts, 'Building food literacy and positive relationships with healthy food in children through school gardens.' (2012) 8(4), *Child. Obes.*, 392-395.

⁹⁵ Green Thumbs, *Green Thumbs Growing Kids, School Food Gardens in Ontario: Educating for Health and Sustainability* (2013) Toronto.

⁹⁶ JD McAleese, LR Linda, 'Garden-Based Nutrition Education Affects Fruit and Vegetable Consumption in Sixth- Grade Adolescents.' (2007) 107(4), *JAND*, 662-665.

⁹⁷ J Morris et al., 'Garden-Enhanced Nutrition Curriculum Improves Fourth-Grade school Children's Knowledge of Nutrition and Preferences for Some Vegetables.' (2002), *JAND Research and Professional Briefs*, 91-93

⁹⁸ J Morris & M. Briggs, S. Zidenberg-Cherr, 'Development and Evaluation of a Garden-Enhanced Nutrition Education Curriculum for Elementary School Children.' (2002) 26(1), *Journal of Child Nutrition & Management*.

⁹⁹ MM Ratcliffe, KA Merrigan, BL Rogers, JP Goldberg, 'The Effects of School Garden Experiences on Middle School-Aged Students' Knowledge, Attitudes, and Behaviors Associated With Vegetable Consumption.' (2011) 12(1), *Health Promot Pract*, 36-43.

¹⁰⁰ MR Savoie-Roskos, H Wengreen, C Durward, 'Increasing fruit and vegetable intake among children and youth through gardening-based interventions: A systematic review.' (2017) 117, *J. Acad. Nutr. Diet.*, 240-250.

¹⁰¹ KR Skelton, C Lowe, DA Zaltz, SE Benjamin-Neelon, 'Garden-based interventions and early childhood health: An umbrella review.' (2020) 17, *Int. J. Behav. Nutr. Phys. Act.*, 121.

positive effect particularly on preference for and intake of vegetables.¹⁰² School gardens paired with cooking and tasting activities appear to be more effective than nutrition education when it comes to improving dietary outcomes.¹⁰³ Other positive results included children's enhanced introspection and ability to work collectively and collaboratively.¹⁰⁴ In the United States, since 2004, federal funding has been available for the initial cost of implementing school gardens in conjunction with nutrition education.¹⁰⁵ This may explain the increase of gardens in American elementary schools from 11.9% in 2006-2007 to 31.2% in 2013-2014.¹⁰⁶

Gardening programs are also important to improve students' knowledge of and attitudes towards the natural environment. Findings from a survey of over 2,000 respondents living in large urban areas indicated that active gardening during childhood strongly influences positive adult values about trees and plants.¹⁰⁷ A study of gardening programs involving elementary and middle-school students from Texas and Kansas, found a significant improvement in pupils' positive environmental attitudes.¹⁰⁸

Providing children with the opportunity to connect with food and nature through tactile and playful experiences, develops their imagination, observation and inquiry skills and teaches them how to care for plants, and grow their own food. For example, in the Edible Schoolyard, a public middle school gardening program in Berkeley, California (Edible Schoolyard program):¹⁰⁹

'Students get to pick a place in the garden to call their own, a place to sit alone to do their required journal writing - a practice that shows...again and again, and in their own beautiful voices, how porous children are to the natural world. "The bees, the spiders, the ants," wrote one sixth-grader, "the roly-pollies, the bugs, the sound, the sky, the birds, the clouds, the yellow leaves...the leaves rustle with hidden secrets that even the laziest man would be dying to know. And the bees, gracefully floating from flower to flower, sing of flowers and gnomes and fairies who never seem to show themselves to anything but the bees, the birds, and the trees. I smell fresh air...I see beautiful white flowers...and figs. I wonder, when are figs ready to eat?'

The excerpt from this student's journal shows that experiential learning activities spark children's capabilities to observe, reflect, and inquire,

¹⁰² P DeCosta et al., 'Changing children's eating behaviour' (n 87), 327-357.

¹⁰³ Id.

¹⁰⁴ CW Robinson, JM Zajicek, 'Growing minds: The effects of a one-year school garden program on six constructs of life skills of elementary school children.' (2005) 15(3), HortTechnology, 453-457

¹⁰⁵ EJ Ozer, 'The effects of school gardens on students and schools: Conceptualization and considerations for maximizing healthy development.' (2006) 34(6), Health Education & Behavior, 846-863.

¹⁰⁶ L Turner, M Eliason, A Sandoval, FJ Chaloupka, 'Increasing prevalence of US elementary school gardens, but disparities reduce opportunities for disadvantaged students.' (2016) 86, J. Sch. Health, 906-912.

¹⁰⁷ VI Lohr, CH Pearson-Mims, 'Children's Active and Passive Interactions with Plants Influence Their Attitudes and Actions toward Trees and Gardening as Adults.' (2005) 15(3), Hort Technology, 472-476.

¹⁰⁸ TM Waliczek, JM Zajicek, 'School Gardening: Improving Environmental Attitudes of Children Through Hands-On Learning.' (1999) 17(4), Journal of Environmental Horticulture, 180-184.

¹⁰⁹ A Waters, Edible Schoolyard: A Universal Idea (1st ed. Chronicle Books, 2008) 29.

empowering them to become active participants in their learning experiences and, ultimately, fulfilling their right to partake in the process.

Giving children the opportunity to actively engage in their education through experiential components of school curricula positively influences also their learning outcomes and ensures the realization of their right to develop their talents and abilities to their fullest potential. For example, the mother of a student, who also participated in the Edible Schoolyard program, reported the remarkable difference this experience made in her son's behavior:

'The garden has completely changed [my son]!...[he] used to come home and play video games and watch TV all night. Now he comes home and talks and talks about the garden and everything happening there. He talks to the family and our friends and neighbors, and now he has started making up stories about gardens and plants.'

Cooking programs provide students with the opportunity to engage in cooking activities and food preparation. A review of studies that investigated how they may influence outcomes such as food preferences, intake, and willingness to try new foods found that cooking classes increase consumption, preference for vegetables, and the inclination to taste new fruits and vegetables.¹¹⁰ For instance, during the Edible Schoolyard program, after showing the kids how to slice the bread and saute' kale in olive oil and garlic, the teacher noticed:¹¹¹

'The kids toasted the bread slices and began piling kale on top of them. They took a long time with this, making careful little patterns, and then they placed them all on a platter and brought the platter to the table for the other kids to share...[T]he first kid stare[d] at the platter. After a long time, this girl finally took a piece of toast with greens and passed the platter. The next kid, a boy whose parents lived across town, did the same thing: he stared and stared before suddenly making his selection. When the third kid also did the same, [the teacher] realized what was happening: they wanted to eat the ones they personally had made! And once they had found a toast they'd put together with their own hands, the kale vanished in no time. [Everybody] realized just how surprising a child's taste can be, and [was] reminded how much more likely they are to enjoy something they've created with their own hands.'

This example demonstrates that when children are given the opportunity to actively participate in their learning process through nutrition-based experiential activities, they choose to taste and eat healthy foods because they are no longer passive beneficiaries of such interventions, but rather they become agents of change.

Evidence shows that when children are involved in the preparation of their food, not only they eat significantly more vegetables, but also, they experience increased feelings of valence (feeling positive) and dominance (feeling in

¹¹⁰ P DeCosta et al., 'Changing children's eating behaviour' (n 87), 327-357.

¹¹¹ A Waters, *Edible Schoolyard: A Universal Idea*, (n 109) at 28.

control).¹¹² In another circumstance, the teacher of the Edible Schoolyard program recalled:¹¹³

'Then came the wonderful day that...students [made] pancakes from scratch. As each class came into the kitchen, they found nothing on the tables except the recipe, written out. Diving into groups, they had to do everything: find the ingredients, measure the right amounts, mix the batter, turn on the stove...[In the end] there were runny pancakes, and pancakes that would've made great Frisbees, and others that could've been hokey pucks, and others that were delicious, but they were all still pancakes, and you would've thought those kids had climbed Mount Everest, they were so proud.'

Partaking in experiential learning activities like cooking increases children's confidence and self-esteem. Regardless of the results, they feel validated and empowered to experiment with food, to take risks, and to face new challenges.

Other benefits associated with cooking programs include building life-skills such as food preparation, teamwork, leadership, decision making and self-efficacy. For example, at the question "What have you learned in the kitchen?" students that participated in the Edible Schoolyard program provided a range of responses:¹¹⁴

'I learned that vegetables are better than I thought; I learned how fun washing dishes can be...[.] how to cook food without burning it; I learned how to manage my eating habits...[.] how to cut without cutting myself; I learned the value of food, and [finally that] in the kitchen patience can lead to being full.'

The students' answers demonstrate that when children are given the opportunity to actively participate in their nutrition education, they can change their perceptions related to food, build healthier habits, learn important life skills and, ultimately, exercise their right to partake in decision-making processes affecting their lives.

Often part of cooking classes and school gardens, taste lessons aim at teaching children how to enjoy food, to recognize the differences between foods and their qualities, and to form correct eating habits. Sensory educational programs targeting, in particular, primary school pupils have been conducted in France, under the name of Classes du goût, since 1990.¹¹⁵ The ultimate goal of these classes was to expose children to the tastes of traditional nutritious foods and evolve them into healthy eaters and well-informed consumers. Sensory educational programs have since been

¹¹² K van der Horst, A Ferrage, A Rytz, 'Involving children in meal preparation. Effects on food intake' (2014) 79, *Appetite*, 18-24.

¹¹³ A Waters, *Edible Schoolyard: A Universal Idea*, (n 109) at 29.

¹¹⁴ A Waters, *Edible Schoolyard: A Universal Idea*, (n 109) at 72-73.

¹¹⁵ Puisais, J., & Pierre, C., *Le Goût et l'enfant* (1st ed. Flammarion 1987).

implemented in many other countries.¹¹⁶ They include exercises focusing on the five senses, that appeal to children's curiosity and interest. Studies have shown that through the process of tasting, smelling and getting to know new foods, children's neophobia can decrease and their preferences for foods and flavors can be positively influenced.¹¹⁷

The benefits of these experiential learning programs have been highlighted also by international bodies. The Special Rapporteur on the Right to Food, Oliver Schutter, in his country visit to Canada in 2012, for example, recommended school garden programs to ensure that all children, at all times, have access to healthy and nutritious food.¹¹⁸ In 2010, FAO published *A New Deal for School Food Gardens*, to highlight the multiple benefits of these programs and encourage governments and development partners to promote school gardens in order to improve nutrition. According to the FAO:

There is clear and growing evidence that:

- consuming specific vegetables can have a marked effect on children's health;
- growing and preparing garden food at school increases children's preferences for healthy fruit and vegetables;
- food gardening, combined with nutrition education, results in voluntary changes in diet;
- gardening activities, especially with organic approaches, improve children's understanding of and attitudes towards the natural environment; and
- hands-on learning and learning by doing induce a much higher retention rate than "chalk and talk".¹¹⁹

Finally, FAO stressed that experiential learning activities related to food can inform environmental education as well as emotional and social development by adding a practical dimension to these subjects.¹²⁰ They can also reinforce basic academic skills like reading, writing, math and sciences.

Conclusions.

This paper attempted to describe the benefits of designing and implementing experiential learning activities, like gardening, cooking and taste

¹¹⁶ See K Mi-Hye and C Hae-Kyungm, 'Sensory education program development, application and its therapeutic effect in children' (2014) 8(1), *Nutrition Research and Practice*, 112–119.; and also Y Uchisaka, *Sensory Education in Class* (Tokyo: Godo-Shuppan 2007) 64–73.

¹¹⁷ S. Mustonen, & H Tuorila, 'Sensory education decreases food neophobia score and encourages trying unfamiliar foods in 8-12-year-old children.' (2010) 21(4), *Food Quality and Preference*, 353e360. <http://doi.org/10.1016/j.foodqual.2009.09.001>. See also C Reverdy et al., 'Effect of sensory education on willingness to taste novel food in children' (2008) 51(1), *Appetite*, 156-65.

¹¹⁸ UN, Report of the Special Rapporteur on the right to food, Olivier De Schutter, Mission to Canada (2012), A/HRC/22/50/Add.1, available at <https://documents-dds-ny.un.org/doc/UNDOC/GEN/G12/189/56/PDF/G1218956.pdf?OpenElement>

¹¹⁹ Food and Agriculture Organization (FAO), [2010] *A New Deal for School Gardens: Promoting Lifelong Healthy Eating Habits*

¹²⁰ UN, *School Gardens: Education and Nutrition Go Together*, Says FAO (2005) available at <https://www.un.org/press/en/2005/sag381.doc.htm>.

classes, in the school curricula to positively influence students' food preferences and eating patterns. The paper argued that these nutrition-based interventions can be effective measures to combat child obesity and overweight, while also improving children's learning outcomes, lifestyle choices, social skills, and respect for the environment. Adopting these programs contributes, ultimately, to the realization of children's right to adequate food and development as well as their right to participate in the decision-making processes that affect their nutrition, wellbeing, and education.