

# **Learn4Health: New Innovative Approaches to Teaching Children about Food, Nutrition and Health**

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**Abstract:** Increasingly, children experience a disconnection from understanding just where and how the food they are eating is produced. This tendency is a product of the nature of our globalized food systems, where we as consumers have hardly any interaction nor insight into the food we consume, until we meet it in the supermarket. This, of course, has an immense impact on food choices and eating habits, which might affect our health, our understanding of nutrition, the environment and ethical dilemmas such as fair trade and animal welfare. Reconnecting consumers, and especially children to the food they are consuming, and the natural world they inhabit, therefore, stands as a massively important task. For this reason, the Erasmus+ project, Learn4Health, was created. Learn4Health aims to communicate and disseminate a better understanding of food, food production, nutrition and health for pupils in primary and secondary schools. This is done by developing new and innovative teaching strategies and methods, where pupils are placed in concrete ‘hands-on’ learning contexts and activities. What is unique about the project is the constellation of partners; one higher educational institution or organization and one primary and/or secondary school working together – making this a truly interdisciplinary and multifaceted collaboration represent each of the six countries participating. In this paper, we intend to present the project and its approaches, discuss the findings and preliminary results, and, finally, present the strategies to secure the sustainability, transferability and dissemination of the project.

**Keywords:** children, health, nutrition, innovation, interdisciplinarity

## **Introduction**

Increasingly, children experience a disconnection from understanding just where and how the food they are eating is produced. This tendency is a product of the nature of our globalized food systems, where we as consumers have hardly any interaction, nor insight into the food we consume until we meet it in the supermarket. This, of course, has an immense impact on food choices and eating habits that might affect our health, our understanding of nutrition, the environment and ethical dilemmas such as fair trade and animal welfare (Dyg, 2014). Focusing on children as an essential target group is especially prudent, as habits are often established at an early age and include taste and preferences for specific foods (Piaget, 1969; WHO 2015; Lowe et al., 2014; Heimendinger & Van Duyn, 1995; Crockett & Sims, 1995). Reconnecting consumers, and especially children to the food they are consuming, and the natural world they inhabit, therefore, stands as a massively important task. For this reason, the Erasmus+ project, Learn4Health, was created.

Learn4Health is an Erasmus+ Strategic Partnership, which include twelve partners in total, representing 6 European countries; The Netherlands, Spain, Slovenia, Denmark, Lithuania and the United Kingdom. It is the aim of Learn4Health to communicate and disseminate a better understanding of food, food production, nutrition and health for pupils in primary and secondary schools. This is accomplished by developing new and innovative teaching strategies and methods, where pupils are placed in concrete 'hands-on' learning food contexts and food related activities. What is unique about the project is the constellation of partners; one higher educational institution or organization and one primary and/or secondary school from each country working together – making this a truly interdisciplinary and multifaceted collaboration. In this paper, we intend to present the project and its approaches, discuss the findings and preliminary results, and, finally, present the strategies to secure the sustainability, transferability and dissemination of the project.

## **Approaches**

As Piaget notes (1969), habits are often established at an early age, which is why teaching children about the origin of food, and increasing their food literacy is essential to create awareness in regards to health, nutrition and the environment in order for them to be able to act and involve themselves in their meals. Further, according to WHO: "A healthy diet helps protect against malnutrition in all its forms, as well as non-communicable diseases (NCD's), including diabetes, heart disease, stroke and cancer." (WHO 2015). Today, the availability of processed and fast food has increased immensely, also due to the fact that we spend more time away from home, causing convenience food to become

more in demand (Bäckström et al. 2004). This fact will expectedly have a negative effect on our perception of food and food production, especially for children, only furthering the disconnect and knowledge gap. This, in turn, has also great consequences on the increase in worldwide child obesity (WHO 2017).

According to Dyg (2014), the school is an essential arena to address this gap of knowledge as it provides a very suitable context for promoting good health practices and for teaching about food. The school context can in this optic be utilized as an ideal space and environment to nurture a connection between nature and children, and to strengthen the understanding of food production and processes. Further, exposing children to vegetables and especially the growth of vegetables has shown to be a key factor in increasing children's liking for the exposed vegetables as well as to other vegetables and healthy foods (Houston-Price, 2009; Cooke, 2007). An added benefit to this is the well-documented fact that healthy pupils are better prepared to learn (Kristjánsson et al., 2010; KL, 2015). The aim of the Learn4Health project is to create new, interdisciplinary and innovative methods and hands-on learning context for pupils within the school, to strengthen the pupils' understanding of health, food and food systems, and to enhance their overall food literacy. A great strength of the Learn4Health project is the unique collaboration and blended learning between public schools and higher educational institutions (Clausen & Fisker, 2017). This cooperation creates the possibility to focus on the strengths of interdisciplinary and blended learning approaches. Blended learning approaches are being increasingly incorporated into educational courses all across the world, as it focuses more on better student outcomes and more effective learning (Jones, 2016). In the Learn4Health project, the Problem-Based Learning (PBL) approach is used to accomplish this. Problem-based learning is a highly recognized study method, which is widely utilized at Aalborg University in Denmark. Essentially, the problem-based learning method organizes the learning process in a way that students/pupils are constantly and actively engaged in finding answers themselves (Graaf and Kolmos, 2007). The professors Anette Kolmos and Erik de Graaff (2017) from Aalborg University states that problem-based learning is defined by ill-structured and open-ended problems, which can provide a good context for learning. Such complex tasks are not easy to solve independently, therefore interdisciplinary group efforts are involved in PBL (Graaf and Kolmos, 2007: p.4). The PBL model aims at ensuring that students or pupils' project work is exemplary regarding both the content and approach. The word exemplarity implies that learning outcomes achieved during concrete project work will be transferable to similar situations encountered by pupils in other contexts. In Learn4Health, the method of problem-based learning is widely implanted, using

food, nutrition and health as the underlying learning occasions to support the development of interdisciplinary, entrepreneurial, digital and language skills and qualifications (Clausen & Fisker, 2017; Kofoed & Fisker, 2005). In the project, the practical methods implemented are experimental approaches, which involves hands-on learning activities by including 'garden to table' aspects and training, student-centred supportive learning and co-creation as well as open school approach reaching out to local community enterprises and farms (ibid.)

In the following, we will introduce three examples of the developed projects within Learn4Health to illustrate the chosen approaches: *The Sprout Wagon*, *The WannaB Foodie Entrepreneur*, and *Case Competition* held in connection with the 2018 World Food Summit in Copenhagen, and thereby discuss the findings and preliminary results of these.

## **Preliminary Findings and Results**

Throughout the Learn4Health project, each country has been responsible for developing, implementing and evaluating one or more small projects. Several of these projects use gardening as the learning context, considering, that much research clearly shows a clear connection between garden-based learning and nutritional and environmental awareness, improved action competencies and overall well-being (Dyg, 2014; Dyg & Wistoft 2018; Waliczek & Zajicek, 1999; Bai et al., 2014; Suriano, 2012). An example of such a project is *The Sprout Wagon*, a project made in an interdisciplinary collaboration between architects and engineers at Aalborg University and schoolteachers at Arden School in Denmark. The Sprout Wagon is a mobile steel construction, designed to carry trays to grow different sprouts and with its own adjustable light and water system, designed to mirror natural conditions to provide pupils with fun and educational hands-on experiences while learning about the process of growing, calculating, measuring and nurturing their own sprouts (Fisker et. al, 2018). Another project is the *WannaB Foodie Entrepreneur*, a project made in a collaboration between the two Slovenian partners, the Centre for Health and Development Murska Sobota and the France Prešeren Črenšovci Primary School. This project sees the pupils being actively involved in the construction and upkeep of school-owned raised garden beds, cultivating and growing local and traditional herbs and plants. When the crops are harvested, the pupils take their herbs to a local market and festival, where they market, showcase and sell their results, thereby also honing their entrepreneurial skills.

Both of these projects have the intended impact of cultivating a better understanding of food and its origin and production in the pupils learning ability. The projects also bring the pupils in situations and contexts that connect them to their surrounding nature. Both projects establish great emphasis on placing the pupils in practical, hands-on situations, which will teach them invaluable practical skills now, and in the long-term. These projects are designed to fit Learn4Healths overall aim of creating new interdisciplinary ways to promote the understanding of health, food and nutrition and in specific the origin of food to children. Both the Sprout Wagon and the WannaB Foodie Entrepreneur are examples of how new, innovative and interdisciplinary approaches to school gardens and garden-based learning can be developed in praxis (Ibid.)

Another very interesting and valuable project within the Learn4Health frame was a summer school course, developed by Aalborg University, and conducted in Copenhagen in August 2018. This summer school training course was held in collaboration with the Danish Ministry of Environment and Food at the annual international World Food Summit in Copenhagen. All Learn4Health partners were present, not only to facilitate the training course, but also to present the project and its preliminary results through several events and sessions. The summer school training course was conducted as a *case competition*, an international competition where 30 international students were gathered to develop concepts that could answer the questions in regards to the theme: children and health. The 30 students were given only two intense days to create a stop-motion film that could communicate their concept and message, using vegetables and fruits as their actors. There were lectures by a range of different experts in the field, among those the partners from the project, and on the final day, three of the groups presented their concepts at the old Danish Stock Exchange for the final summit sessions, where a panel of judges, led by the Danish Minister of Environment and Food, crowned a winning team. At this point in the Learn4Health project, all partners were well into the process of developing and implementing their respective projects, which meant that each of them brought very valuable preliminary inputs and insights to the event. All efforts marking this event as a pivotal context to work and further develop the innovative approaches to foodscape teaching and learning, with a point of departure in cases related to Learn4Health. A foodscape originates from the word landscape and is a combination of relations between food, places and humans (Hedegaard 2015). The ideology of scapes is an illumination of the constantly changing surroundings of products, humans and ideas, which are present and interconnected at all time. The event focused on providing both theoretical and practical expertise on developing new designs and prototypes as well as strategies and curricula on how to integrate a foodscape pedagogy into existing school curricula.

The success and impact of a project such as Learn4Health rests not only on the successful development of new innovative approaches and prototypes, but also on how these innovative results, insights and experiences are disseminated and sustained. Throughout the project, therefore, a great emphasis has been put on strategies in optimizing the impact, transferability and dissemination of the project, on both local, national and international levels.

### **Impact, transferability and dissemination of the project**

Throughout the process of intense collaboration, communication and meetings, the Learn4Health project has had an impact on the participants and the participating organizations by increasing their skills, knowledge and competencies regarding novel instructional and evaluation techniques applied to food, nutrition and health pedagogies. The commencement of the project partner's work on their individual projects has had and will have a potential impact on their approaches when teaching about food, food production, nutrition and health. The unique composition and structure of the partnership, not only between different educational sectors, but also between six vastly different cultural and socio-economic national contexts, has contributed with valuable knowledge. The approaches, direction and results of the project have been impacted very positively by this truly interdisciplinary and international collaboration, where partners have had opportunity to discuss, debate and workshop their preliminary results as well as exchange useful feedback.

The dissemination of the project results inside and outside the partnership will be carried out primarily on the project's website [www.learn4Health.eu](http://www.learn4Health.eu). Furthermore, the project's overall agenda has been disseminated outside the project partnership through the publication of a series of scientific papers. Additionally, all project partners have been working diligently on the dissemination of the process of the project and its preliminary results. This has been done, partly, through various outreach activities, where Learn4Health has been presented and discussed in many different fora and settings, and to a great number of diverse groups of people across Europe at both local, regional, national and international levels. At local and regional levels, each partner has worked to disseminate the project and the preliminary results within their organization and on their specific surroundings and communities through organizational channels and at various outreach activities and events. This dissemination strategy has been found important, to make sure the project has a great foundation and resonance within the different local spheres involved in Learn4Health, grounding the project not only

on a European collaborative level, but also at local levels. All efforts to strengthen the sense of ownership and relevance within the organizations and communities, which thereby could gain great insights and benefits from the project and its results in praxis.

At a national and EU level, the dissemination strategy has and will be focused on the creation of the HOFA Handbook, which will have been developed upon the completion of the project Learn4Health. The HOFA Handbook is designed to be a complete instructional guidebook offering detailed instructions and curricula guides to the different Learn4Health projects (Fisker et al, 2018). The purpose of the HOFA Handbook is to secure the optimal applicability and transferability of the insights and detailed information about the different Learn4Health projects to all interested audiences. The HOFA Handbook will include teaching material for both students and teachers, and it will include instructional guides and blueprints for the constructions involved in some of the projects, experiences, insights and suggestions, and options for scaling projects up or down to comply with resources, time frames and other criteria in different settings. The HOFA Handbook will feature a short 'highlight' section, where each project is presented, and the option of a 'read more' section as appendices, where the more instruction-heavy projects can attach relevant documents (Ibid.). The targeted audiences for the HOFA Handbook are on several levels: at a local level, the target audiences are teachers, parents and students interested in the insights and implementation of one or more of the projects of Learn4Health. On a broader local and regional level, the target audiences are school administrations, municipalities and organizations who could benefit from the insights and results. On a national level, the target audiences are governmental authorities and non-governmental organizations who have interests in education, youth and health-related issues and policies on a national level. On the EU/international level, the target audiences are EU-related authorities and organizations, as well as international non-governmental organizations who have interests in education, youth and health-related issues and policies on an EU or international level.

The HOFA Handbook will be produced as a book in PDF format and be available through the Learn4Health website at the end of the project, freely accessible for all interested audiences across Europe. This open access will secure wide dissemination, applicability, and great transferability. The HOFA Handbook will secure the sustainability of the Learn4Health project, as the insights, experiences and the knowledge accumulated within the project period will be passed on to a wide audience, easily available for application, and therefore also optimizing the overall impact.

## **Conclusion**

We can conclude that we are witnessing how children are increasingly experiencing a disconnection from understanding the origin of food. This tendency has become a product and nature of our globalized food systems, where we as consumers have hardly any interaction nor insight into the food we consume until we meet it in the supermarket. Inevitably this situation has a serious impact on our eating habits and food choices, as well as our understanding of health, and has direct consequences for the environment and ethical dilemmas such as fair trade and animal welfare. With the understanding that habits are established early in life, reconnecting current and future consumers to the food they are eating, and the natural world they inhabit, therefore, stands as a massively important task. This has been the overall aim of the EU Erasmus+ Strategic Partnership, the Learn4Health project. Using problem-based learning and interdisciplinary methods and approaches, as well as understanding the school context as an essential arena to reach the aim of the project, Learn4Health has focused on new ways of teaching children about food, nutrition and health, providing hands-on learning contexts to strengthen their understanding of the origin of food, and the structure of food production. Projects such as the Sprout Wagon, The WannaB Foodie Entrepreneur and a summer school training course in the form of a case competition, are examples of how the project has initiated and developed new, interdisciplinary and innovative approaches. Approaches that deal with innovative teaching methods and learning contexts, which aim to create, strengthen and sustain health, nutrition and food literacy among pupils in primary and secondary schools in Europe in order to decrease food-related illnesses and child obesity. A great emphasis has been invested on strategies for optimizing the impact, transferability and dissemination of the project, on both local, national and international levels. On an international level, the HOFA Handbook will stand as the most important result, as its open access and structure secure wide dissemination, applicability, and great transferability of all results. The HOFA Handbook will secure the sustainability of the Learn4Health project, as the insights, experiences and the knowledge accumulated within the project period will be passed on to a wide audience, easily available for application, and therefore also optimizing the overall impact. This way, we believe, the Learn4Health project will stand as a great example on how to initiate, promote, teach and cultivate the very necessary food literacy our children need. It is possible to educate them and provide them with action competences – Hands On Food Activities - that enables them to act on the basis of this knowledge, to create a healthier self and a better, sustainable world.

## BIBLIOGRAPHY

- Bai, Y., Suriano, L., Wunderlich, S.M. (2014). Veggiecation: A Novel Approach to Improve Vegetable Consumption Among School-Aged Children: *Journal of Nutrition Education and Behaviour*. 46, (4), p320–321.
- Bäckström A., Pirttilä-Backman A. M., Tuorila, H., (2004), Willingness to try new foods as predicted by social representations and attitude and trait scales, *Appetite*, 43, p75-83.
- Clausen, K. & Fisker A.M (2017). Learn4Health, a European project creating health and food literacy through innovative interdisciplinary teaching and learning methods in: *Proceedings of the 4th Teaching & Education Conference*, Venice, May 2017, pages 53-59.
- Cooke, L. (2007). The importance of exposure for healthy eating in childhood: a review *J Hum Nutr Diet*, 20, p294–230.
- Dyg, P. (2014). Fostering Food Literacy and Food Citizenship through Farm-School Cooperation and beyond. Ph.D. Aalborg, Denmark: Department of Civil Engineering, Aalborg University.
- Dyg, P. (2014). Fostering Food Literacy and Food Citizenship through Farm-School Cooperation and beyond. Ph.D. Aalborg, Denmark: Department of Civil Engineering, Aalborg University.
- Dyg P. & Wistoft K. (2018). Wellbeing in school gardens – the case of the Gardens for Bellies food and environmental education program, *Environmental Education Research*, DOI: 10.1080/13504622.2018.1434869
- Fisker, A.M; Heilmann, A.E & Bagger, N. (2018). The Mobile Sprout Wagon - an innovative new approach to improving pupil's health through interdisciplinary hands-on food activities. Published in *Proceedings of the 41st International Academic Conference*, Venice, p 50-63.
- Graaf and Kolmos, (2007) History of problem-based and project-based learning. *Management of Change*, DOI: [https://doi.org/10.1163/9789087900922\\_002](https://doi.org/10.1163/9789087900922_002).
- Hedegaard L. (2015). Foodscapes: Sociologiske forståelser af madkultur. In: Fuglsang, J. & Stamer, N. *Madsociologi*. København: Munksgaard. 179-193.
- Heimendinger, J. & M. Van Duyn. (1995). Dietary behavior change: the challenge of recasting the role of fruit and vegetables in the American diet. *American Journal of Clinical Nutrition*, 61, pp. 1397S-1401S.
- Houston-Price, C., Butler, L. & Shiba, P. (2009). Visual exposure impacts on toddlers' willingness to taste fruits and vegetables: *Appetite*. Volume 53, Issue 3, Pages 450–453.
- Koefod, L. & Fisker, A.M. (2005). Changing curriculum bit by bit. *Published in Proceedings of the 4th ASEE/AaeE Global Colloquium on Engineering Education, Sydney, September 2005*.
- Kristjánsson, Á., Sigfúsdóttir, I. and Allegrante, J. (2010). Health Behavior and Academic Achievement Among Adolescents: The Relative Contribution of Dietary Habits, Physical Activity, Body Mass Index, and Self-Esteem. *Health Education & Behavior*, 37(1), pp.51-64.

Larsen, V. A. (2018). Teacher Manual for Soil'n Garden program (SGP). Arden, Denmark.

Lowe, C. F., Horne, P. J., Tapper, K., Bowdery, M., & Egerton, C. (2004). Effects of peer modelling and rewards-based intervention to increase fruit and vegetable consumption in children, *European Journal of Clinical Nutrition* 58, p510-522.

Osowski, C., Göranson, H. and Fjellström, C. (2011). Children's understanding of food and meals in the foodscape at school. *International Journal of Consumer Studies*, 36(1), pp.54-60.

Piaget, J. (1969). Barnets psykiske udvikling. København: Hans Reitzels Forlag A/S. p20-35.

Suriano, L. et. al. (2012). New Resources for Nutrition Educators: *Journal of Nutrition Education and Behaviour*. Volume 44, Number 3.

Waliczek, T.M., Zajicek, J.M. (1999). School Gardening: Improving Environmental Attitudes of Children Through Hands-On Learning. *Journal of Environ. Hort.* 17(4): 180-184.

WHO (2015). Healthy Diet. World Health Organization, Europe. [Accessed 11th May 2016]. Available at: <http://www.who.int/mediacentre/factsheets/fs394/en/>.

WHO (2017). Commission on Ending Childhood Obesity: *Facts and Figures on Childhood Obesity*. Available: <http://www.who.int/end-childhood-obesity/facts/en/>. Last accessed 15th July 2018.