



# Subject-Integrated Food Education for Food-Related Learning in Early Primary School

Louise Hård





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*Det har jag aldrig provat förut, så det klarar jag helt säkert.<sup>1</sup>*

Pippi Långstrump

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<sup>1</sup> I've never tried that before, so I'm quite sure I can do it (author's translation). Pippi Longstocking.



# Abstract

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Students' food-related knowledge and skills have the potential to influence their food choices and, consequently, their health and well-being over time. In Sweden, education related to sustainable food choices is traditionally addressed in the later years of primary school, whereas formal home economics education begins in grade six (students aged 12 years). However, younger students in early primary school already seem to have food-related questions and reflections. The aim of the present thesis is to explore how food can be utilized as a pedagogical tool in early primary school through a co-design process of subject-integrated food education, promoting students' food-related learning.

This doctoral thesis explores co-designed subject-integrated food education from multiple perspectives, including teachers' initial perceptions of subject-integrated food education, the co-design process, and the implemented teaching practices from both teaching and learning perspectives. The overall methodological approach of the research was a qualitative case study. A co-design process was employed to explore, design, implement, and evaluate subject-integrated food education in early primary school (students aged 6–9 years). The research is informed by a sociocultural perspective that frames the theoretical approach and analysis. Data were collected using questionnaires, interviews, participant observations, and field notes from co-design sessions and classroom observations.

The findings reveal the importance of a food-supportive school culture characterized by an organizational structure that facilitates collaboration among school staff and provides time for planning food-related learning

activities. Teachers' food education knowledge and skills, as well as the facilitation of subject-integrated food education, emerged as crucial factors. The findings further highlighted food as a familiar, tangible, and experience-generating pedagogical tool that supported both learning *about* food and learning *through* food, thereby facilitating students' food-related learning. The use of food as a pedagogical tool also encouraged food-related communication, the structuring of information, and the observation of the visual characteristics of fruits and vegetables. Furthermore, exploratory, collaborative, and non-negotiable food-related learning moments were identified during the learning process. These findings highlight the importance of a skilled food educator who recognizes and responds to students' food-related initiatives and who aligns their teaching methodology with students' playful interests and levels of knowledge.

In conclusion, subject-integrated food education in early primary school benefits from organizational support provided by school management, collaborative practices, and institutional and educator expertise in food-related knowledge and skills. The findings have implications for teacher education and school management, emphasizing the need for professional knowledge and organizational structures that support subject-integrated food education from an early age.

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# List of Original Papers

This text is based on the following original papers, which are referenced in the text as Papers I–IV.

I: Hård, L., Palojoki, P., & Larsson, C. (2025). Co-designing subject-integrated food education with early primary school teachers. *Educare*, (4), 254–282. <https://doi.org/10.63310/edu.2025.4.60037>

II: Hård, L., Palojoki, P., & Larsson, C. (2024). Swedish primary school teachers' experiences of subject-integrated food education. *International Journal of Home Economics*, 17(1), 32–47. [https://www.ifhe.org/fileadmin/user\\_upload/IJHE-Vol-17-Iss-1-A3-Hard.pdf](https://www.ifhe.org/fileadmin/user_upload/IJHE-Vol-17-Iss-1-A3-Hard.pdf)

III: Hård, L., Palojoki, P., & Larsson, C. (n.d.). “What are grapes that stick together called?”: Using food as a pedagogical tool in early primary school. (Accepted for publication in *Scandinavian Journal of Educational Research* 2026-03-30).

IV: Hård, L., Palojoki, P., & Larsson, C. (n.d.). Capturing food-related learning moments through subject-integrated food education in early primary school. (Accepted for publication in *Education 3-13* 2026-04-09). <https://doi.org/10.1080/03004279.2026.2660712>



# Introduction

Food embodies much more than the nutrients it provides for survival. Embedded within its sociocultural context is memories, identity markers, pleasure, comfort, and well-being. Everybody's experience of food is unique, including the culture and preferences connected to it (Contento, 2011). In an educational setting, students<sup>2</sup> not only seek answers about food items but also about its global interconnections, such as the origins of food and its production chain. However, contemporary food production is often far from transparent, even though students are required to make numerous decisions regarding their food choices<sup>3</sup>. Early primary school students may have limited insight into food production, generally restricted food-related knowledge, and narrow food preferences.

According to the Swedish national curriculum (National Agency for Education, 2024a), students' food-related questions are not systematically addressed through food education until grade six, when home economics education is often introduced. However, students as well as teachers engage in food education much earlier, for example, through students' questions about food origins and food groups.

This doctoral thesis on food and nutrition focuses on food education and seeks to promote food-related learning and the promotion of students' sustainable food choices. It is grounded in global sustainability goals and public health perspectives, based on the Brundtland Report (World Commission on Environment and Development, 1987). Sustainability, encompassing social (including health-related), economic, and environmental dimensions, forms the foundation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (United Nations, 2015). Moreover, people's food choices are closely connected to the Global Goals, particularly those addressing health and well-being and responsible consumption and production (United Nations, 2015).

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<sup>2</sup> In this thesis, *students* refer to learners aged 6–9 years (see p. 19).

<sup>3</sup> In this thesis, the term *food choices* are used in preference to *habits*, *patterns*, or *eating*, as it emphasizes the active nature of decision-making (see p. 20).

Furthermore, in 2019, the EAT-Lancet Commission concluded that sustainable diets should include more whole grains, fruits, vegetables, nuts, and legumes while reducing the intake of processed foods, meat, and dairy products for both health and climate reasons (Willett et al., 2019). The Commission also emphasizes the importance of reducing salt and sugar, regulating fat intake, and achieving an appropriate overall energy intake (Rockström et al., 2025). The updated 2025 EAT-Lancet report highlights the need for a just and equitable food system spanning both the production and consumption chains, in addition to sustainability. However, the EAT-Lancet Commission stresses that plant-rich food choices should remain compatible with different food cultures and individual preferences (Rockström et al., 2025).

Despite the recommendations of a plant-based diet (Rockström et al., 2025), the Swedish population eats insufficient portions of fruit, vegetables, and whole grains (Public Health Agency of Sweden, 2019). The low intake of fruits and vegetables remains a key challenge in reaching nutrition recommendations in Sweden (Blomhoff et al., 2023), reflecting the inherent complexity of sustainable food choices.

Apart from environmental aspects, the need for food education is evident at both societal and individual levels. Socioeconomic differences in food choices are well documented; higher levels of education and income are associated with healthier food choices (Fismen et al., 2016; Public Health Agency of Sweden, 2019). In line with Sweden's public health goals for good and equitable health (Commission for Health Equity, 2017), all students should acquire knowledge about sustainable and healthy food choices regardless of their family background. This highlights the importance of systematic food education in schools, particularly from an equity perspective (Ares et al., 2023; Bjørkkjær et al., 2023). Furthermore, schools provide an important arena for food education given that students encounter repeated opportunities for learning over extended periods (Love et al., 2020).

Despite the evidence that an early start to food education can promote students' sustainable food choices, Swedish early primary school curricula do not include home economics education when students are at an age for food preference development (Ares et al., 2024; De Cosmi et al., 2017; Dudley et al., 2015; Worsley et al., 2016). Thus, the present doctoral thesis contributes to the research areas of food and nutrition, food education, and home economics education by exploring subject-integrated food education for food-related learning in an early primary school setting.

## Aim and Research Questions

The overall aim of the present thesis is to explore how food can be utilized as a pedagogical tool in early primary school through a co-design process of subject-integrated food education, promoting students' food-related learning. The aim is addressed through four research questions, which are explored in the individual studies (Papers I–IV).

- I. What elements are considered significant in the co-design process when using food as a pedagogical tool in primary school?
- II. What are Swedish primary school teachers' experiences of subject-integrated food education and their perceptions of the opportunities and challenges associated with subject-integrated food education?
- III. How can food be used as a pedagogical tool to promote food-related learning among early primary school students?
- IV. What kinds of food-related learning moments emerge during lessons designed to promote subject-integrated food education?



# Background

## Concepts Related to Food Education

In the present doctoral thesis, *food* is approached broadly, encompassing both nutritional and cultural aspects (Benn, 2014) as well as social, economic, and environmental dimensions (United Nations, 2015). *Education* has been described as a purposeful activity, practice, and process intended to foster knowledge, understanding, and growth (Chazan, 2022). In a school context, education is grounded in the national curriculum and consists of interactions among four elements – teachers, students, lesson content, and environments<sup>4</sup> (Ball & Forzani, 2007). This thesis adopts a sociocultural perspective within a socioconstructivist learning theory paradigm in which learning is conceptualized as an active, social, situated, and mediated process of meaning-making (Säljö, 2022). *Food education* refers to education supporting the growth of individual knowledge and skills related to food and eating (Fordyce-Voorham, 2016), aiming to promote sustainable food choices (Pulimeno et al., 2020; World Health Organization, 2006). Food education helps students understand the effects of food choices on their own and others' well-being (Janhonen et al., 2016). In addition to its connection to health, the concept of food education has been described as multidisciplinary, aiming not only to promote health but also to address sustainability, culture, and well-being (Benn, 1996; Janhonen et al., 2016; Laitinen et al., 2021; Palojoki, 1997). It has also been described as a means of promoting sustainable food choices (Vargas et al., 2025). Sutter et al. (2019) further defined food education as:

education that supports learning about food, nutrition, and the role that plays in one's life, relationships, culture, communities, environment, and in history and society – has the potential to help youth develop the

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<sup>4</sup> The Didactic Triangle of Herbert depicts these elements as an equilateral triangle with teacher, learner, and content (Hopmann, 2007). However, the addition of 'environments' aligns with the sociocultural perspective adopted here.

critical thinking skills necessary for making healthy choices in everyday life (p. 995).

If food education relates to pedagogy and classroom situations that strive for food-related learning and promote students' sustainable food choices within curricular frameworks, the concept of food literacy can be understood as encompassing food-related knowledge and skills. These are connected to the practices of making food choices and can be seen as an aim of food education (Benn, 2014; Vidgen & Gallegos, 2014). Food literacy focuses on multiple lenses (Renwick & Powell, 2019; Slater, 2013; Smith et al., 2022; Vidgen & Gallegos, 2014). Beyond practical food-related knowledge and skills, food literacy also involves higher-order cognitive abilities, including critical thinking, analytical reasoning, and communicative competence (Renwick & Powell, 2019). In early primary school, food education aimed at developing food literacy may include food familiarization, food categorization, and food production (Ares et al., 2023).

In striving to promote students' food-related learning in line with food literacy, the present thesis focuses on classroom practices in food education, specifically subject-integrated food education. Table 1 presents the central concepts and their definitions related to food education.

Table 1. Central concepts related to food education in the present thesis.

<b>Concept</b>	<b>Definition</b>
Food education	Education supporting the growth of individual knowledge and skills related to food and eating (Fordyce-Voorham, 2016), aiming to promote sustainable food choices (Pulimeno et al., 2020; World Health Organization, 2006).
Whole school approach to food education	Food-related learning both inside and outside the classroom involving various members of the school staff and sometimes extending to parents and local actors (Edwards et al., 2025; Shallcross, 2006).
Integrative approach to learning	Integrating multiple school subjects, developing integrative thinkers, combining different perspectives for a broader view (Haapaniemi, 2022).
Subject-integrated food education	Combining different subjects in food-related teaching and learning (Hård et al., 2024).
Home economics education	A multidisciplinary knowledge area to achieve sustainable living and wellbeing, focusing on the knowledge and skills needed to manage everyday resources (International Federation for Home Economics, 2008).
Food-related learning	Learning emphasizing food, including experience with food (Benn, 2014); learning through and about food (Hård, 2026).
Food literacy	The combined knowledge, skills, and critical awareness required to evaluate, manage, and prepare food effectively and make food-related decisions impacting individual health to global sustainability (Vidgen & Gallegos, 2014; Smith et al., 2022).
Sustainable food choices	Food choices that promote sustainability in relation to health and the environment at both individual and societal levels, in the short and long term (Hård, 2026).

In the present thesis, the focus is on subject-integrated food education for food-related learning and promoting students' sustainable food choices. Sustainability is understood as encompassing both health and environmental dimensions. This dual focus on sustainability is reflected in Nordic nutrition recommendations (Blomhoff et al., 2023), which emphasize both the nutritional and environmental aspects of sustainable food choices (G. Berg et al., 2024; James-Martin et al., 2022).

## The Complexity of Food Choices

In the school context, students' food choices are shaped by both conscious and unconscious factors (Monterrosa et al., 2020). Food plays multiple roles in students' lives, linking health, sustainability, pleasure, and everyday practices, while social norms and sensory experiences further influence their decisions (Fleming et al., 2021; Janhonen, 2016). Except for availability,

students' food choices are formed through a combination of experiences, preferences, sociocultural norms and traditions, political awareness, and exposure to commercial influences (Contento, 2011). In addition, schools, peers, and the media play a significant role in shaping students' food-related decisions (Ekström, 1995; Parinder, 2012). However, although social structures influence food choices, they do not fully determine individual actions (Giddens, 1979). Research in food education consistently shows that taste preferences are often prioritized when choosing food (Gelinder et al., 2020; Janhonen, 2016; Palojoki & Tuomi-Gröhn, 2002). Moreover, students' food choices are connected to identity (Belasco, 2008; Rendahl, 2018), convenience and responsibility (Belasco, 2008), and social belonging (Janhonen, 2016).

Increasingly, food and health messages spread through everyday digital environments, emphasizing, for example, the role of social media (Qutteina et al., 2022). In the 1990s, Giddens (1991) stated that established health authorities had already been challenged by self-proclaimed experts. At the same time, it has been recognized that social networks often exert greater influence on children and adolescents than official health authorities (Palmlblad & Eriksson, 1995). Many students feel insecure about who to trust and how to find reliable sources of food messages (Rendahl, 2018). In food education, teachers must navigate between public and private spheres, particularly regarding students' sustainable food choices (Bohm & Oljans, 2025). However, education and learning do matter; it is seen today that the impact of food and health messages depends on students' knowledge, skills, and attitudes toward food (Qutteina et al., 2022).

Conversely, there is a well-documented knowledge–action gap in relation to food choices (Graham et al., 2006). Knowing about sustainable food does not necessarily lead to the practice of sustainable food choices (Colombo et al., 2023; Palojoki, 1997). The complexity in food choices challenges the traditional linear approach to knowledge transfer from teacher to student, which is often emphasized in schools (Lave, 1988; Palojoki, 1997). On the other hand, the complexity of food choices, which are situated within social and personal contexts, means that students' food choices change over time (Sobal & Bisogni, 2009) and over context (e.g., school or home) (Janhonen, 2016). Research shows that food education has also proven to impact those choices (Ares et al., 2023; Worsley et al., 2016).

## Addressing Students' Food-Related Learning Needs

Food preferences related to taste are shaped through experience, and early taste challenges can have a lasting influence on lifestyle (De Cosmi et al., 2017; Dudley et al., 2015). Therefore, challenging students' taste preferences is central to food education (Foinant et al., 2021; Gelinder, 2020; Kaufmann & Macey, 2010). Accordingly, food education has increasingly moved toward sensory and experiential approaches (Beinert, 2021; Berg et al., 2023; Bohm, 2022; Gelinder, 2020; Hård et al., 2024). Sensory-based food education is effective in encouraging students to try unfamiliar foods, broaden their preferences, and create positive experiences with fruits and vegetables (Dazeley et al., 2012; Kähkönen et al., 2018; Mustonen et al., 2009; Mustonen & Tuorila, 2010; Reverdy et al., 2008, 2010). Beyond expanding food preferences, engaging students' senses through sensory-based food education allows them to describe, reflect on, and discuss foods (Jonsson et al., 2005; Mustonen et al., 2009; Sepp & Höijer, 2016).

At the same time, tensions may arise between personal taste preferences and sustainability concerns, for instance, in relation to the bitterness of certain vegetables (Sandell et al., 2014). Additionally, students' development of food preferences often involves balancing curiosity to try new foods with a fear of the unfamiliar (Fischler, 1988). Recent studies further emphasize the value of experience-based learning in food education, highlighting its potential to create meaningful and engaging learning opportunities for students (Beinert et al., 2021b; Berg et al., 2023; Bohm, 2022; Hård et al., 2024).

## The Development of Food Education in Sweden

Historically, concerns about population health have been closely connected to national security and economic interests (Palmlblad & Eriksson, 1995). In 1900s Sweden, debates on counteracting undernutrition and fostering moral and social order led to the introduction of food education through the school subject of home economics in Swedish schools. In this context, four arguments were put forward for introducing home economics as a school subject – economic, moral, pedagogical, and nutritional (Johansson, 1987).

From the early twentieth century onwards, advances in nutrition science have increasingly shaped public policy on food education (Hjälmeskog, 2000).

To make nutrition-related aspects of food education more understandable, Swedish authorities have introduced food guide graphics that emphasize the importance of variety in food choices and illustrate the proportions and relationships among different food groups. The food circle was introduced by the National Institute of Public Health in 1963, and the plate model in 1992 (G. Berg et al., 2024; Palmblad & Eriksson, 1995). In addition, the food pyramid, introduced in 1974, was recently updated to reflect contemporary dietary guidelines (Swedish Food Agency, 2025). These graphics are designed to educate the public about recommended food choices.

Despite the use of food guide graphics in Swedish compulsory schools, food education theory proved cognitively demanding in home economics education, particularly for primary school students (Palojoki, 1997; Palojoki, 2003). Research conducted in the 1990s on food education revealed that students often conflated nutrients with foods, underscoring the need for more critical perspectives on food guide graphics (Nordin, 1992). Palojoki (1997) proposed starting lessons with concrete foods and meals rather than abstract nutrition, thereby linking instruction to everyday life and supporting both motivation and comprehension.

## Contemporary Food Education in Swedish Schools

Today, the Swedish school subject in home economics education is called home and consumer studies, which plays an important role in education on everyday life issues, with core content in food and cooking, personal finances and consumption, and lifestyle habits (National Agency for Education, 2024a). To facilitate everyday life and promote sustainable development, the stated aim of the school subject is to ensure that students develop (National Agency for Education, 2024a, p. 51):

the ability to evaluate choices and actions that occur in a home based on how they affect health, finances, and the environment.

Learning in home and consumer studies covers food and cooking skills, sustainability, food culture, equality, and consumer education. Three perspectives permeate health, environment, and personal finance (National

Agency for Education, 2024a). Teaching and learning highlight knowledge-in-action, the integration of theoretical and practical knowledge (Molander, 1997; Säljö, 2022), and the learning potential inherent in student activity (Rogoff, 1995; Vygotsky, 1978).

Despite today's extensive syllabus in home and consumer studies (Gisslevik et al., 2016; Oljans et al., 2018), it remains the subject with the fewest allocated teaching hours in compulsory school (130 hours), compared with, for instance, art (240 hours), crafts (330 hours), and mathematics (1,230 hours) (National Agency for Education, 2024b). Of these, 40 hours are allocated to primary school (ages 6–12) and 90 hours to lower secondary school (ages 13–15) (National Agency for Education, 2024b), most often delivered between grades six and nine.

Nordic–Baltic food education research<sup>5</sup> over the past decade has highlighted the importance of curious taste and sensory-based food education (Gelinder, 2020). It is important to develop students' food preferences in order to promote sustainable food choices (Gelinder & Hjälmskog, 2025; Gisslevik et al., 2017). A recent meta-study of food education research shows that food-related sensory activities can be done using food or by learning about it, and they may or may not involve tasting. The sensory activities can further facilitate students' social competencies, self-awareness, and critical thinking (Weiser et al., 2026).

Furthermore, language use in home economics education (Hipkiss, 2014), food aesthetics (Berg et al., 2023), interthinking in group work (Taar, 2017), and awareness and development of home economics teacher identity (Paas, 2024) have been studied. Food education is also scientifically recognized as an arena for discussing sustainability issues (Gisslevik et al., 2017; Oljans et al., 2018), not least through its potential to facilitate critical classroom dialog (Beinert, 2021). Also, the potential of using school meals as educational resources has been highlighted in previous research (Berggren, 2021; Persson Osowski et al., 2013; Waling & Olsson, 2017).

Sustainability education inevitably involves normative components (Bohm, 2023), which must be critically and thoughtfully balanced to support students in tasting new foods (Leer & Wistoft, 2018).

Using students' taste preferences as a starting point in food education allows teachers to engage with its normative aspects without valuing the

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<sup>5</sup> Within home economics education and educational school meals.

students' experience of food (Gelinder & Hjalmskog, 2025) or categorizing foods in moralistic terms, such as “good” and “bad” (Berg et al., 2022). Instead, the focus is on conveying positive and inclusive food-related messages (Gelinder & Hjalmskog, 2025; Stok et al., 2016).

## Challenges in Integrating Food Education in Early Primary School

Research in home economics education has highlighted the interdisciplinary nature of food education, as evidenced in the STEAMkitchen project, which integrates the disciplines of Science, Technology, Engineering, Arts, and Mathematics. The project focused on developing learning tasks for everyday and practical life skills in home economics education, as well as providing professional development that integrates home economics education with STEAM (Paas et al., 2025).

However, there are several barriers to the integration of food education across different subjects in early primary school. One important challenge is that food and health are often given lower priority than other academic achievements, which reduces the emphasis placed on food education in schools (Love et al., 2020). In addition, a lack of management in schools hinders the implementation of food education (Aydin et al., 2021; Haapaniemi, 2022; Love et al., 2020; Sutter et al., 2019). Another major barrier concerns time and structural constraints. A lack of time is frequently emphasized alongside limitations in scheduling integrated education and limited financial resources (Bergling et al., 2022; Haapaniemi, 2022; Haapaniemi et al., 2019; Jones & Zidenberg-Cherr, 2015; Lindblom, 2016). Furthermore, teachers face multiple challenges at the classroom level. In addition to a heavy workload, competing expectations and the perception that food education is an unrelated subject matter are consistently highlighted as barriers (Bergling et al., 2022; Jones & Zidenberg-Cherr, 2015; Perera et al., 2015). Teachers also report difficulties related to curricular limitations and a lack of teaching materials as well as inadequate formal training in food education (Love et al., 2020; Metos et al., 2019; Tilles-Tirkkonen et al., 2018). The lack of subject-integrated food education in teacher education is unfortunate, given that teachers' self-efficacy and confidence are important factors in the success of any educational endeavor (Hawkins et al., 2020).

Despite the barriers mentioned above, several enablers may support the successful integration of food education. In the Australian primary school context, a key factor is positioning food education as a core function of schools rather than treating it as a time-limited activity squeezed into an “overcrowded” curriculum (Love et al., 2020). Integrating food themes across different subjects can also help address obstacles such as limited time for planning and financial constraints (Kelly & Nash, 2021). Successful implementation further depends on teacher support, which requires school management commitment and sufficient resources (Love et al., 2020) as well as high-quality teacher education (Nanayakkara et al., 2018).

## Educational School Meals

School meals, provided free of charge, were introduced to all students in Sweden in the 1940s, following discussions during the 1930s, a period that emphasized the importance of students’ health (Gullberg, 2006; Palmblad & Eriksson, 1995). The reasons for the introduction were not only health-related but also educational and aimed at promoting social justice (Palmblad & Eriksson, 1995). Moreover, the school meals aimed at educating the students’ families about proper meal practices (Gullberg, 2006; Palmblad & Eriksson, 1995).

Today, the publicly funded nutritious school meals provided to all students in Swedish compulsory schools offer multiple opportunities for food education (Persson Osowski et al., 2013; Vargas et al., 2025; Waling & Olsson, 2017). In addition, a common meal provides learning opportunities by encouraging students to try new foods and engage socially (Berggren et al., 2020). The Swedish Food Agency (2023) highlights school meals as tools for learning and promoting sustainable food choices. However, the learning opportunities of school meals are challenging due to their dual role as both recreational and educational contexts (Benn & Carlsson, 2014). Also, the importance of an inclusive school meal, encompassing acceptance of diversity in both meal composition and social interaction from the students’ perspective, has recently been highlighted in research (Sandberg, 2026).

In addition, while many early primary teachers see the meal as a learning opportunity and consider themselves to be role models, meals often remain non-reflective activities that fail to reach their educational potential. Research further shows that teachers’ behavior during school meals varies between

being sociable, educational, or evasive (Persson Osowski et al., 2013), and they do not always make use of food as an educational opportunity. These missed opportunities may be related to limitations in teachers' knowledge and skills regarding food education (Berggren et al., 2020; Sepp & Höjjer, 2016). To use the pedagogical lunchtime as an educational opportunity, teachers need support to make school meals more pedagogically meaningful (Waling & Olsson, 2017), in line with a whole-school approach to food education.

## Striving for a Whole School Approach to Food Education

The United Nations World Food Programme (2023) emphasizes a whole-school approach to food education as essential. Such an approach includes food-related learning both inside and outside the classroom, involving various members of the school staff, and may also extend to parents and local actors (Edwards et al., 2025; Shallcross, 2006). Research in food education shows that a whole-school approach is preferred for achieving success (Sutter et al., 2019). At the same time, there is a risk that food education may be reduced to ad hoc activities rather than becoming genuinely embedded in education (Clarke et al., 2013; Love et al., 2020). Consistency in school food culture and practicing what is taught is also important (Bryant et al., 2023; Shallcross, 2006). Repeated and continuous opportunities for learning are, therefore, vital (Love et al., 2020). A whole-school approach requires both committed school management and a consistent food culture that is integrated into the curriculum (Bryant et al., 2023; Laitinen et al., 2023; Vargas et al., 2025). However, implementing such an approach requires time, resources, and organizational support (Haapaniemi, 2022; Lindblom et al., 2020).

De Vlieger et al. (2019) recommended an integrated approach to food education to address time constraints, while Love et al. (2020) underlined that such integration is essential for ensuring that food education is embedded in the core curriculum. Similarly, Jørgensen et al. (2014) suggest that food education should be integrated across all subjects rather than treated as isolated activities. Correspondingly, subject-integrated learning approaches have proven particularly effective in engaging children and embedding food education across the curriculum (Dudley et al., 2015; Kubik

et al., 2002). This aligns with the Swedish national curriculum, which states the following (National Agency for Education, 2024a):

Everyone working in the school shall work together to make the school a good environment for development and learning. Teachers shall collaborate with other teachers in the work to achieve the educational objectives, and organise and carry out the work so that the pupil/.../ is given opportunities for interdisciplinary work (p.14-15).

Moreover, the teacher should: balance and integrate knowledge in its various forms (p. 12).

In addition, school management is responsible for ensuring the following:

The teaching in different subjects integrates interdisciplinary areas of knowledge, such as the environment, traffic, gender equality, consumer issues and the risks of tobacco, alcohol and other drugs (p. 20).

In practice, this means integrating food themes across school subjects to broaden perspectives and strengthen learning. A national survey in Swedish compulsory schools showed that many teachers already use food-related themes to teach across different subjects, although they also highlight the need for more time to plan teaching schedules that better support integration (Lindblom, 2016).

Subject-integrated teaching can contribute to interdisciplinary knowledge building, strengthen holistic understanding, and support students in developing connections across different knowledge domains (Blackshields, 2015; Haapaniemi, 2022; Lindblom, 2016; National Agency for Education, 2024a).

Experiences of subject integration and food have been explored in other contexts, such as home economics education, mathematics, and sustainability education, but typically in grades other than primary school. For example, Haapaniemi (2022) developed an integrative approach to learning acknowledging home economics, and Brante and Brunosson (2014) studied the integration of mathematics in a home economics setting in the context of students with special educational needs. However, there is a lack of research on teaching and learning about food and sustainability from a student perspective (Gelinder, 2020; Gisslevik, 2018). Moreover, food education has been successfully linked with mathematics, science, and English (Perera et al., 2015), as well as with mathematics and science alone

(Kubik et al., 2002). Both integrative teaching (Spelt et al., 2009) and learning are highlighted (Blackshields, 2015).

In this thesis, a subject-integrated food education approach is developed and applied, inviting early primary school teachers to collaborate across subjects related to an integrative approach to both teaching and learning. In Swedish primary schools, several subjects provide opportunities for such integration, for example, science (food and health, food chains), social studies (sustainability from a societal perspective, historical changes), languages (concepts and communication), home and consumer studies (cooking skills, food culture, sustainable consumer choices), art (visual representation), and mathematics (scaling recipes). This integrative approach combines knowledge from different disciplines (Spelt et al., 2009) and promotes a holistic understanding (Blackshields, 2015).

Subject-integrated food education further encompasses teaching and learning about food from multiple perspectives, including sustainability, health, and culture (Haapaniemi et al., 2022; International Federation for Home Economics, 2008). In this doctoral thesis, the concept of food as a pedagogical tool serves as the integrating element, offering opportunities to deepen, broaden, and contextualize both food-related learning and subject-specific knowledge.

## Sociocultural Perspective on Food and Learning

This thesis adopts a sociocultural perspective on learning and development, in which learning is understood as a social, cultural, and mediated process (Säljö, 2022; Vygotsky, 1978). In addition, learning is viewed as an active and situated process (Rogoff, 1995).

Students' learning and cognitive development are not separate from their experiences outside of school. Rather, learning is a collaborative, culturally embedded process shaped by mediating tools, activities, and social interactions (Gauvain, 2001; Säljö, 2022; Vygotsky, 1978). From a sociocultural perspective, learning is not a linear transfer of knowledge but a context-dependent process that emerges and develops through social and cultural practices (Gauvain, 2001). From this perspective, learning is understood as a complex, active process of meaning-making through social internalization (Vygotsky, 1978) and apprenticeship (Rogoff, 1990) rather

than as a direct outcome of teaching. It is also co-constructed, dynamic, and context-dependent (Osborne & Wittrock, 1983).

Rogoff (1990) further described this situated learning as an “apprenticeship in thinking,” where learners develop cognitively through guided participation. Appropriating new concepts and terms enables students to develop their language skills, which, in turn, supports cognitive development (Säljö, 2022; Vygotsky, 1986). With effective support and scaffolding from teachers, peers, or other resources, students can reach beyond their current level of knowledge and access the zone of proximal development (Eun, 2019; Säljö, 2022; Vygotsky, 1978). The students’ learning and development were further stated by Vygotsky (1978, p. 87):

What a child can do in cooperation today, he can do alone tomorrow.

Through communication and joint thinking with others who are more knowledgeable, students extend their learning beyond what they can achieve independently. As Vygotsky described, with the right support, the learner becomes “a head taller” (Vygotsky, 1978, p. 102). In this doctoral thesis, collaborative learning is often seen in classroom situations within learning discussions. Learning, from this perspective, takes place through active engagement with others in culturally meaningful contexts. In addition, learning is a situated process that occurs within social relationships and cultural practices (Rogoff, 1995; Säljö, 2022). Rather than focusing on teaching as the driver of students’ learning processes, this perspective highlights student agency and positions learners as the main actors in their own development.

The sociocultural perspective frames this thesis, including the choice of theoretical concepts, the data collection, and the interpretation of the findings. For instance, it frames students as active constructors of knowledge and positions learning as a participatory and collaborative process. The deliberate use of the term *students*, even for children aged 6–9, underscores the author’s view of young learners as active participants in their educational journey. In this doctoral thesis, the choice of the concept of *student* (rather than *pupil*) signals a broader pedagogical shift from a teaching-centered to a learning-centered approach (Barr & Tagg, 1995).

A participant-centered perspective aligns closely with the co-design approach and the subject-integrated food education featured in the study. Co-design inherently relies on collaboration, shared creativity (Blomkamp,

2018), and collective thinking (Sendra, 2024), all of which align with a sociocultural perspective on learning, which is embedded in the given context, i.e., here in the case school (Säljö, 2022; Vygotsky, 1978).

Throughout this thesis, a food education perspective is adopted in relation to student food choices. This perspective acknowledges that human interactions with food are shaped by considerations from an interdisciplinary perspective, and that food selection is influenced by both individual and societal factors (C. Berg et al., 2024). However, the concept of food choices reflects the active role of a food consumer while acknowledging that these choices are shaped by situational and contextual factors beyond the individual. It also aligns with the broader sociocultural theoretical framework.

## Learning through Mediators

From a sociocultural perspective, all learning is shaped within social contexts and through various mediating tools (Säljö, 2022; Vygotsky, 1978). The concept of mediation provides a way to understand how individuals interact with and interpret the world. Vygotsky further argues that people do not experience the world directly but through mediating tools (Vygotsky, 1986). Mediating tools can be categorized into material and intellectual, combined as cultural tools (Säljö, 2022), or even humans acting through social interactions (Säljö, 2022; Vygotsky, 1978). The use of various cultural tools, together with social interaction, facilitates learning processes within the framework of situated learning (Rogoff, 1995; Säljö, 2022; Vygotsky, 1978).

Among cultural tools, language is considered a powerful tool for learning and knowledge development (Eun, 2019; Gauvain, 2001; Rogoff, 1995; Säljö, 2022; Vygotsky, 1978). According to Vygotsky (1978), language mediates both communication and thinking. As students are introduced to written language, words begin to shape and structure their thought processes, providing new cognitive tools for reflection and understanding. More broadly, language functions as a central mediating tool essential for communication, cognition, problem-solving, and meaning-making (Säljö, 2014; Vygotsky, 1978). Similarly, food can serve as a tool for developing social and communicative skills (Hendy & Raudenbush, 2000), especially when students are actively engaged in communicative learning tasks.

This sociocultural perspective also highlights the active role of students in shaping their own learning experiences (Smidt & Lindelöf, 2010). For instance, research in home economics education demonstrates that an active student role can significantly enhance learning, supporting reflection and discussion (Beinert, 2021; Taar & Palojoki, 2022). This requires teachers to encourage and activate students, inviting them into dialog, collaboration, and critical reflection (Håkansson, 2015; Janhonen et al., 2016). This view of learning positions students as active participants capable of asking questions, taking initiative, and engaging critically rather than as passive recipients of knowledge (Janhonen, 2016). Furthermore, it aligns with the concept of learning as an interactive, participatory process wherein students are co-constructors of knowledge (Rogoff, 1995). Furthermore, students engaging in interthinking<sup>6</sup>, questioning, arguing, reasoning, and explaining facilitates learning and understanding (Taar & Palojoki, 2022).

## Learning through Play and Creativity

Since this thesis focuses on early primary school students, there is a need to examine the relationship between play, creativity, and learning more closely. According to Vygotsky, all humans are creative, with creativity being a skill developed through lived experiences and social interactions (Lindqvist, 2003). Vygotsky viewed creativity not as separate from learning but as central to it (Vygotsky, 1995). Furthermore, children make sense of their experiences through imaginative activity and play (Lindqvist, 2003; Vygotsky, 2016). For instance, play offers a space for exploration and spontaneity, enabling children to combine what they know with new possibilities. It also fosters the emergence of original ideas (Vartiainen et al., 2024). From a sociocultural perspective, play is connected to the zone of proximal development through learning and development mediated by language and social interaction (Vygotsky, 1916, 1978). Furthermore, the playful character of learning is rooted in curiosity (Proyer & Ruch, 2011) and is closely tied to imagination and the ability to reframe or reimagine familiar concepts (Strandberg, 2017; Vygotsky, 1995).

Research in food education has shown that adopting a playful approach is especially beneficial when teaching young children (Dazeley & Houston-

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<sup>6</sup> Students thinking together through questions and discussions while solving interdisciplinary learning tasks (Taar & Palojoki, 2022).

Price, 2014; Hellegren et al., 2025; Højer et al., 2020; Strandberg, 2017). Play and creativity, in the context of this doctoral thesis, refer to early primary school students' (aged 6–9 years) use of imagination to transform experiences and generate new understandings.

## Learning through Food

From a sociocultural perspective, food contributes to meaning-making and understanding by functioning as a mediating tool (Säljö, 2022). According to Cooper (2013), food is not just a subject but a teaching tool that can be easily used in learning. Through food, we can enhance our understanding of the world, learn about culture, and share our identity. In addition, prior research in home economics education has shown that food possesses communicative, concrete, and everyday characteristics that enable it to support teaching both visually and cognitively (Höijer, 2013) while also engaging and motivating students (Beinert et al., 2021b; Haapaniemi et al., 2022). This familiarity with food is connected to a fundamental learning principle described by Säljö (2014), namely that learning involves recognizing something new in relation to something familiar.

Furthermore, food's tangible nature can facilitate understanding (Hård et al., 2024; Palojoki, 1997; Stapleton, 2022), while familiarity with food enhances student engagement (Hård et al., 2024; Höijer et al., 2011) and supports the motivation to learn (Haapaniemi et al., 2022). Food in this doctoral thesis is further explored as an intentional *pedagogical tool*, combining teaching and learning, allowing students to learn both *through* and *about* food (i.e., food-related learning). A pedagogical approach to food includes an awareness of and competence in food education, and the use of food as a pedagogical tool in classrooms. From a sociocultural perspective, the foundation for understanding food as a pedagogical tool is consistent with the Vygotskian definition of cultural mediation: food can serve as a mediating tool in a sociocultural learning process.

# Methodology

This doctoral thesis is a qualitative case study framed by a co-design process of exploring, designing, implementing, and evaluating phases of subject-integrated food education (Hård et al., 2025).

## A Case Study of Subject-Integrated Food Education

An exploratory and embedded case study design was adopted (Yin, 2018) to develop an in-depth understanding and generate theoretical insights into subject-integrated food education and food-related learning in early primary school (Thomas, 2011). Case study design is commonly used in educational research as an empirical strategy for investigating contemporary phenomena in real-life contexts (Harrison et al., 2017; Yin, 2018). Case studies involve intensive, in-depth investigations to capture the complexity of the phenomenon under study (Coe et al., 2025). They allow researchers to explore complex issues by drawing on multiple sources of data and through repeated visits to the research site. Case studies are particularly valuable when examining new or insufficiently understood phenomena that require detailed descriptions or evaluations, such as educational research (Yin, 2018).

The case study adopted in this thesis incorporates ethnographic elements. Ethnographic research seeks to understand the lives of individuals or groups by interpreting their choices and experiences as they unfold in natural settings. The primary research instrument is the researcher themselves, who must be self-aware and reflexive, balancing empathy with analytical distance. Contradictions and conflicts are often recorded in detailed field notes, positioning the researcher as both an insider and an outsider (Hammersley & Atkinson, 2019).

The selected school was a compulsory school located in an urban area in southwest Sweden. It was independently operated but free of charge and open to all students from preschool class (age 6) to grade nine (age 15). As in all compulsory schools in Sweden, students were provided with a warm, fully tax-funded school lunch every day. The school's pedagogical profile emphasized

subject integration through thematic area work. The school was selected after contact with the principal, who expressed interest in subject-integrated food education. The study explored subject-integrated food education through a co-design process involving teaching and learning activities with school staff and students.

## A Collaborative Approach for Subject Integration

A co-design (collaborative) approach originates from industrial and technological design, particularly the Scandinavian industrial democracy movement of the 1960s (Gregory, 2003). It focuses on developing innovation through collaboration *with* users rather than designing *for* them (Blomkamp, 2018; Szebeko & Tan, 2010; Zamenopoulos & Alexiou, 2018). Thus, co-design is a democratic and collaborative design approach (Blomkamp, 2018) that emphasizes collective thinking (Sendra, 2024) or collective creativity (Sanders & Stappers, 2008), expressed by Säljö (2014, p. 191):

To converse is to think together.<sup>7</sup>

Co-design, which emphasizes the incorporation of participants' experiences through collaboration, belongs to the same family of approaches as participatory research (Dietrich et al., 2017; McKenney & Reeves, 2020; Roschelle et al., 2006; Trischler et al., 2019) and action research, as all of these approaches aim to foster development through the integration of theory, action, and participation (Sendra, 2024; Zamenopoulos & Alexiou, 2018). However, unlike action research, which is often initiated by teachers to develop practices, co-design involves both researchers and teachers in the design process, adopting an abductive approach to knowledge (Hurley et al., 2021; Zamenopoulos & Alexiou, 2018).

The practice of co-design can be conceptualized as a process encompassing development, implementation, and exploration (Gomoll et al., 2020) or as a cycle of design, realization, and evaluation (Roschelle et al., 2006). As Sendra (2024) stated, there is no common meaning of the co-design process and its phases. In this thesis, the co-design phases of exploring, designing, implementing, and evaluating mirrored the co-design process as applied within the school context. The phases were further inspired by the co-design processes described in previous studies (Table 2).

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<sup>7</sup> Author's translation of "Att samtala är att samtänka" (Säljö, 2014, p. 191).

Table 2. The phases of co-design in different co-design studies.

<b>Scientific paper (context)</b>	<b>Co- design phases</b>						
I have never had a PBL like this before (Gomoll et al., 2020)					<b>Design</b>	Implement	<b>Evaluate</b>
The promise of co-design for public policy (Blomkamp, 2018)			<b>Explore</b>	<b>Design</b>		<b>Implement</b>	
Co-design of innovations with teachers: Definition and dynamics (Roschelle et al., 2006)				<b>Design</b>	Realize		<b>Evaluate</b>
Co-designing services with vulnerable consumers (Dietrich et al., 2017)	Resource	Plan	Recruit	Sensitize	Facilitate		<b>Evaluate</b>
Co-designing subject-integrated food education with early primary school teachers (Hård et al., 2025)			<b>Explore</b>	<b>Design</b>	<b>Evaluate</b>		<b>Evaluate</b>

In co-design, the role of a facilitator is essential to engage participants, promote communication and shared understanding, and help visualize ideas during the design phase (Blomkamp, 2018). The facilitator also acts as a mediator in dialog (Zamenopoulos & Alexiou, 2018), using co-design tools for conversation (Trischler et al., 2019). In this thesis, early primary school teachers and a facilitator (the author) collaboratively co-designed subject-integrated food education through the development of learning tasks and activities. The facilitator contributed to the co-design initiation of subject-integrated food education and brought expertise to food education, while the teachers contributed time and knowledge in their subjects, their students, and the context.

However, a practice–research gap may arise between the teacher’s interests and the facilitator’s aims (Hirschorn & Geelan, 2008). Bridging this gap requires mutual understanding and active engagement from both parties throughout the research process (Bergmark & Graeske, 2022; Hirschorn & Geelan, 2008). For effective research, the researcher and the rest of the co-design team must share an understanding of the developmental goals of the practice. In addition, power relations may exist within the co-design team, as the researcher often holds interpretive authority (Frödén & Isenström, 2022). Furthermore, the early stages

of planning educational research are particularly important for defining responsibilities and expectations as well as allocating time for ongoing evaluations. Good communication among stakeholders, clear common goals, a structured division of tasks, and sufficient time are key success factors in educational research (Bergmark & Graeske, 2022).

In this thesis, co-design served as a guiding framework for developing learning tasks and activities in schools in collaboration between the early primary school teachers and the facilitator.

## Co-designing Subject-Integrated Food Education

The co-design process began following the pre-study<sup>8</sup> investigation of teachers' attitudes toward subject-integrated food education and the conditions for it in primary school, along with approval from the school management. The process began with the introduction of co-designed subject-integrated food education, led by the facilitator. Subsequently, a questionnaire with questions related to subject-integrated food education (Appendix C) was distributed to the primary school staff at the case school to recruit a co-design team. The teachers had a possibility to sign up for participation through the questionnaire. In total, eight teachers showed interest in participating in the co-design team. The team represented the grades from preschool to grade three (students aged 6–9). Throughout the co-design process, the co-design team expanded to a total of 14 teachers and educators, including after-school educators. All participants were qualified teachers or educators with varying levels of teaching experience, ranging from less than one year to over 20 years. The participating teachers ( $n = 14$ ) represented preschool classes through third grade and taught students aged 6–9 years. Most of the teachers were female ( $n = 13$ ). The teachers were responsible for a range of subjects, including art, mathematics, music, home and consumer studies, English, physical education and health, science, social studies, and Swedish, all of which were integrated into the subject-integrated food education. A characteristic feature of the teaching staff at the school was their common interest in subject integration, an approach that was also encouraged by the school management.

In the co-design process initiated by the researcher, the focus was on developing food education for early primary school students through co-creation. The participating teachers contributed their pedagogical and professional expertise, serving as experts on early primary school students and the local

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<sup>8</sup> Conducted by a master student, a PhD student, and the principal investigator.

context, with the goal of collaborating across grade levels. The facilitator focused primarily on researching subject-integrated food education, a process supported by conversational co-design tools (Trischler et al., 2019). The co-design tools used were food education materials and shared insights from food education research on sustainable food education in home economics education (Gelinder et al., 2020; Gisslevik et al., 2017; Oljans et al., 2018). In addition, the co-design process emphasized active participation in collective thinking (Sendra, 2024) and collective creativity (Sanders & Stappers, 2008), which encouraged the development of new perspectives and pedagogical ideas (Blomkamp, 2018). The co-design process resulted in several food-related learning activities across various subjects—encompassing both food education and subject-specific knowledge—and was organized into three knowledge areas – fruit, vegetables, and food waste reduction.

The number of students involved in the implemented subject-integrated food education was as follows – 19 out of 52 in the preschool class, 30 out of 52 in grade one, 34 out of 52 in grade two, and 27 out of 52 in grade three (aged 6–9 years). Teaching was organized by grade; therefore, in this doctoral thesis, a grade corresponds to a single class. Additionally, learning tasks were often carried out in smaller groups rather than with the entire class.

## Data Collection

Various data collection methods, including an open-ended questionnaire, semi-structured interviews, classroom observations documented through field notes, and field notes from co-design sessions, were used to answer the research questions (Table 3).

Table 3. Summary of data used to answer the four research questions.

<b>Data collection method</b>	<b>Total</b>	<b>Participants</b>	<b>Data used in papers</b>
Teacher questionnaire		11 teachers	I, II
Teacher interviews <sup>9</sup>	8 (246 min)	9 teachers	I, II
Classroom observation of lessons in art, English, mathematics, Swedish, social studies, science, music, or a combination of these <sup>10,11</sup>	4,860 minutes	110 students 13 teachers	I, III, IV
Photos (student activity, learning tasks)		~1.000	
Field notes (classroom observation)	35 pages (transcribed in Calibri, 11 pt, single-spaced)		I, III, IV
Field notes (co-design sessions)	6 pages	8 teachers	I
Field notes (evaluation sessions)	8 pages	19 students 11 teachers	I

The data collection period is outlined below according to the four chronological co-design phases.

## The Exploring Phase of the Co-design Process

To gain a more specific understanding of the conditions related to the school context, subject integration, and food education, an open-ended questionnaire for teachers was used as a pre-study. The respondents included teachers from the preschool class to grade six at the participating school. The questionnaire contained seven open-ended questions addressing teachers' experiences, possibilities, challenges, and expectations regarding subject-integrated food education, including themes such as food as a pedagogical tool, food and health, and food and sustainability (Appendix C).

The questionnaire was followed up by semi-structured interviews to gain deeper insights into teachers' experiences of subject-integrated food education (Coe et al., 2025). The interviews were conducted with teachers ( $n = 8$ ) representing the preschool class to grade three (early primary school). The purpose of the interviews was twofold – to deepen the data gathered from the questionnaire and to serve as a catalyst for the co-design process. The interview questions concerned subject-integrated food education and the use of food as a

<sup>9</sup> Including an interview with a home and consumer studies teacher from the pre-study (used in Paper I).

<sup>10</sup> Partly audio/video-recorded (not used in the analyses).

<sup>11</sup> Observation manual in Appendix E.

pedagogical tool (Appendix D). All interviews were audio recorded, transcribed verbatim, and reported in Paper II. The interviews included questions about subject-integrated food education related to co-design and thus also contributed to the dataset of Paper I.

## The Designing Phase of the Co-design Process

The co-design process is framing this thesis. Field notes from the co-design work, covering the phases of exploring, designing, implementing, and evaluating subject-integrated food education, constituted the dataset for the co-design process described in Paper I. In addition, the study involved data collection methods including a pre-study open-ended questionnaire, interviews, field notes from co-design sessions, and field notes from classroom observations. Data from the overall co-design process was further used in Papers II, III, and IV<sup>12</sup>.

## The Implementing Phase of the Co-design Process

During the implementation of the co-designed, subject-integrated food education unit, the author acted as a participant observer, documenting students' learning processes and classroom interactions. As described by Klingberg and Hallberg (2021), the participant observer was actively engaged with the setting, asking questions, showing interest, and striving to understand the empirical context. In addition, the observations focused on the sociocultural aspects of learning, including mediating tools, classroom communication, and students' expressions of curiosity and engagement. Particular attention was given to students' questions and comments that revealed efforts to resolve uncertainty, knowledge gaps, or misunderstandings (Chin & Osborne, 2008). An observation manual (Appendix E) guided the data collection, with a focus on food-related learning moments and the use of mediating tools (Säljö, 2022; Vygotsky, 1978)—specifically food as a pedagogical tool (Höjjer et al., 2011).

Data were collected over 3.5 weeks (October–November 2022) across 18 school days, comprising 46 classroom sessions (approximately 81 hours / 4,860 minutes) with students aged 6–9 years (preschool class to grade three). The researcher produced over 30 pages of detailed field notes, documenting time, setting, and preliminary interpretations, consistent with ethnographic data

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<sup>12</sup> In the research chronology, Paper II was produced before Paper I, as data collection for Paper II was completed earlier. However, the co-design process in Paper I, which encompasses all stages of the research, provides a framing perspective for the thesis and is therefore numbered as Paper I in this thesis.

collection traditions. Approximately 1,000 photographs and 50 slides of teaching materials complemented the written data.

The observations, spanning a range of school subjects, focused on food-related learning moments within the co-designed sessions. The data collected during the classroom observations contributed to Papers I, III, and IV.

Moreover, approximately 300 minutes of audio and 150 minutes of video were collected using a fixed camera and dual audio recorders to substantiate the field notes.

## The Evaluating Phase of the Co-design Process

Teacher and student reflections on subject-integrated food education were collected through evaluation sessions lasting approximately 20–30 minutes each. The teacher teams associated with each class (grade) discussed the evaluation questions (Appendix F) in four separate sessions, with two to three teachers participating in each session ( $n = 3/3/3/2$ )<sup>13</sup>. Students representing each class (grade) participated in four evaluation sessions, during which the learning tasks were evaluated in groups of four to five students per class ( $n = 5/5/4/5$ ). The participating students were selected by the teachers.

The evaluation sessions took place at the school as soon as the implementation of subject integration had ended. To facilitate the conversation, photos of learning activities from the subject-integrated food education were presented in the evaluation sessions. The students were informed that all their thoughts were highly valued and welcome in the research and that they could withdraw from participation at any time. Two of the youngest students chose to withdraw due to a concurrent classroom activity.

The conversations from the evaluation sessions were documented in field notes. Data from the evaluation settings were valuable in understanding different actors' understanding of the subject-integrated food education throughout the research process. To visualize the different phases of the co-design process and draw insights, these data were used in Paper I.

## Data Analysis

This study used a qualitative analysis. In Paper I, an inductive and data-driven analysis was conducted to examine the stages of the co-design. In the remaining three papers (Papers II–IV), the analyses were abductive, combining sociocultural

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<sup>13</sup> Participating teachers from preschool class/grade one/grade two/grade three.

perspectives on mediating tools, the zone of proximal development (Eun, 2019; Säljö, 2022; Vygotsky, 1978), and situated learning (Rogoff, 1995) while remaining open to the emergence of new patterns within the dataset. The analyses were further grounded in concepts of subject integration and food education. In Papers II–IV, reflexive thematic analysis was conducted, allowing flexibility in theory, coding, data use, and thematization (Braun & Clarke, 2006, 2021a).

In Paper I, data were primarily collected from field notes documenting the co-design and evaluation sessions. However, the entire dataset, including questionnaires, interviews, and field notes from classroom observations, was considered relevant for identifying significant elements of the co-design process. The data were transcribed verbatim (Baker, 2006; Kocaman, 2024) and analyzed qualitatively and abductively, searching for patterns related to the research question and the sociocultural conceptual framework. The data were then organized chronologically into four phases of exploring, designing, implementing, and evaluating (Hård et al., 2025). These phases encompassed activities such as participant recruitment, collaborative co-design sessions, enacted classroom practices, and teachers' reflections. Organizing the material in this way made it possible to identify significant elements of subject-integrated food education and interpret their implications for educational practice.

In Paper II, data were collected through interviews (based on questionnaires), and in Papers III and IV from field notes of classroom observations. These data were analyzed using reflexive thematic analysis to generate themes (Figure 1).



Figure 1: The process of thematic analysis applied in this study.

Following Braun and Clarke's (2006) six-phase approach, the analysis involved the following – (1) familiarization with the data through transcription, repeated readings, and note-taking; (2) systematic coding, primarily at the semantic level; (3) generating initial themes, including provisional subthemes; (4) reviewing themes to ensure internal coherence and distinctiveness<sup>14</sup>; (5) defining and

<sup>14</sup> The reviewing phase can involve reworking and reorganizing the themes generated (Nowell et al., 2017).

naming final themes; and (6) producing the written report as an integrated analytic narrative.

Reflexive thematic analysis was chosen due to its flexibility in accommodating diverse data sources and theoretical perspectives (Braun & Clarke, 2006), as well as its openness in the analytic process, allowing evaluation and interpretation without being constrained by predefined categories. In the analysis, the researcher took an active and creative role in the processes of coding and thematization (Braun & Clarke, 2019, 2021b), which were also flexible and interpretative (Bohm & Sundqvist, 2025; Nowell et al., 2017) (Figure 2).

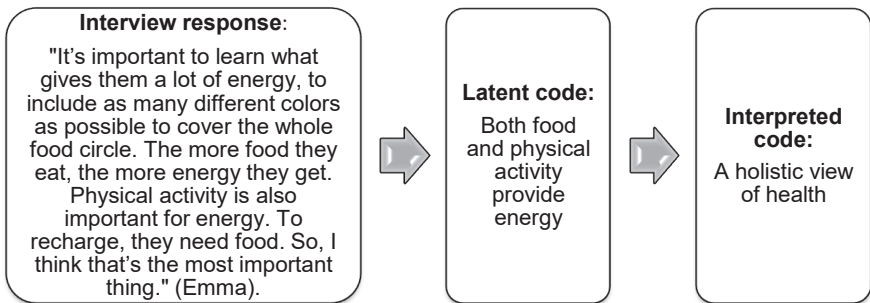


Figure 2: Example of the coding process in Paper II.

However, the analysis was not linear; it involved iterative movement between data and interpretation to identify patterns and develop key themes (Terry & Hayfield, 2021) (Figure 3).

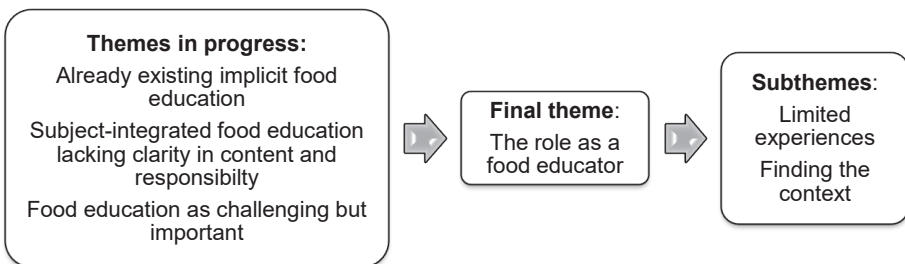


Figure 3: Example of reviewing themes in Paper II.

Moreover, the iterative engagement with the dataset supported the development of themes that were both empirically grounded and theoretically meaningful. Notably, a high degree of flexibility of the thematic analysis requires an active

researcher during the analysis phase, which is why their experience is considered a strength in the analytic process (Braun & Clarke, 2019).

## Ethical Considerations

This research follows the ethical guidelines of the Swedish Research Council (2024), which require informed consent from participants, confidentiality in data storage, and the protection of participants' identities in publications<sup>15</sup>. In addition, when conducting research involving children, the process must be particularly sensitive and responsive to their experiences. Throughout the fieldwork, the researchers balanced their own agenda with respect to the students' rights to personal integrity, food education, and subject-specific learning and to consensually participate in the research (Ólafsdóttir et al., 2024). Although the primary focus of this study was to answer research questions through data collection, the students' integrity and sense of inclusion in the classroom were prioritized.

Only participants who provided informed consent contributed to the research data, although all students took part in food education learning. Consent for the research was approved by the school leader. Informed consent was obtained verbally from all participants and in writing from participating teachers (Appendix A) and students' guardians (Appendix B). The researcher provided the teachers with all information regarding the study, the students were informed by their class teacher, and the guardians received information via the school's digital communication platform, which also allowed them to ask questions. The participation was voluntary and could be withdrawn at any time.

Personally identifiable data were treated confidentially through coding, password protection, and secure storage to prevent unauthorized access. Furthermore, in published material, the case school and all participants were anonymized in accordance with informed consent and ethical guidelines (Swedish Research Council, 2024). Nevertheless, student work produced during learning tasks, as well as verbatim quotations, may be recognizable to the participants themselves.

During the writing of this doctoral thesis, ChatGPT was used to transform the title image to avoid using or exposing the original student work on the title page. Other original student work (for example, the cucumber poem), as well as

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<sup>15</sup> As no sensitive personal data were collected, formal ethical approval from the Swedish Ethical Review Authority was not required. Nevertheless, the Authority's guidance was followed throughout the study (see <https://etikprovningmyndigheten.se/en/>).

participants' verbatim quotations, may nevertheless be recognizable to the individual participants involved in the study.

# Results

The results addressing the research aim are presented in four sections: beginning with the overall co-design process (Paper I), followed by the teacher perspective (Paper II), subject-integrated food education (Paper III), and student learning processes (Paper IV).

## Significant Elements in the Co-design Process

In Paper I, five significant elements in the co-design process of using food as a pedagogical tool were identified (Table 4).

Table 4: Overview of the study results in Paper I.

<b>Research question</b>	<b>Co-design phase</b>	<b>Significant element</b>
What elements are considered significant in the co-design process when using food as a pedagogical tool in primary school?	The exploring phase	Creating space for food education
	The designing phase	Igniting inspiration and fostering collective creativity  Engaging in collaborative thinking to strengthen and motivate
	The implementing and evaluating phases	Addressing food-related questions  Navigating the practical boundaries between creativity and collaboration

The significant elements of co-designing subject-integrated food education during the exploratory phase involved creating space for and facilitating food education. In the subsequent phases of the co-design process, creativity, collaboration, engagement, and food education knowledge and skills were highlighted. The results emphasize the importance of engaged collaboration,

alongside allowing room for individual adaptation so that teaching can be tailored to the specific needs of each classroom context.

For instance, although the school meal environment was used for educational purposes through activities such as vegetable tasting and student-created posters on reducing food waste, collaboration between teachers and school meal staff was limited. For the successful inclusion of school meals and after-school staff in an integrated approach to food education, the findings highlight the need for strategic foresight and coordinated planning. This could be supported through annual activities and an organizational structure that facilitates subject integration.

## Teachers' Experiences of Subject-Integrated Food Education

Findings in Paper II showed that Swedish primary school teachers' experiences and perceptions of opportunities and challenges of subject-integrated food education were largely limited to school meal situations and lacked a systematic structure. Three themes related to the teachers' experiences and the perceptions of the opportunities and challenges associated with subject-integrated food education were generated (Table 5).

Table 5: Overview of the study results in Paper II.

<b>Research question</b>	<b>Theme</b>	<b>Subtheme</b>
What are Swedish primary school teachers' experiences of subject-integrated food education and their perceptions of the opportunities and challenges associated with subject-integrated food education?	The role as a food educator	Limited experiences
	Food as a facilitator of learning processes	Finding the context
		Something familiar
School meals as an educational resource	School meals as an educational resource	Facilitating understanding
		Challenging students' food choices
		Striving for sustainable meals

Some teachers were quite positive and enthusiastic, seeing food as a motivator in teaching and learning. Others were more doubtful about being food educators, unsure how to implement food in their subjects. However, all teachers agreed about the need for food education in early primary school.

All the teachers saw themselves as food educators during school meals, demonstrating sustainable meals through their own plates and discussing sustainable food choices. However, they did not perceive themselves as food educators in the classroom. Moreover, the findings indicated that educational school meal situations could benefit from a clearer structure. Teachers' perceptions of the opportunities offered by food education were closely linked to the role of food as a facilitator in learning processes, with reference to its engaging, familiar, tangible, and experience-generating nature. Teachers identified mathematics and language as school subjects that were especially suitable for integration with food education.

At the same time, they highlighted challenges associated with subject-integrated food education, including curriculum overcrowding, limited time for lesson planning, and teachers' educational competence.

## Using Food as a Pedagogical Tool

In Paper III, food as a pedagogical tool was shown to support learning across different subjects in early primary school. When fruits and vegetables were used as pedagogical tools, students' food-related learning included communicating sensory experiences, categorizing foods into food groups, and attending to the visual characteristics of fruits and vegetables (Table 6).

Table 6: Overview of the study results in Paper III.

Research question	Theme	Subtheme
How can food be used as a pedagogical tool to promote food-related learning among early primary school students?	Food for communication	Describing tastes Interpreting food and health messages
	Food for structuring information	Naming and categorizing fruits and vegetables Understanding food origins
	Food for observing visual characteristics	

By encouraging comparisons and associations to explain sensory experiences, students became more comfortable discussing food and developed a greater overall awareness of it. From the students' perspective, active participation combined with sensory experiences in learning activities was found to enhance engagement and understanding in food-related learning.

In addition, the results of the third study showed that students were encouraged to structure food-related information in response to their questions about fruit and vegetable food groups. This process supported the construction of mental frameworks that were useful at the time and served as a foundation for future food-related learning, as noted by the preschool-class teacher, Linda (Field Note 10)<sup>16</sup>.

The students are collecting words and experiences to build on later in their education.

Food-related learning was observed to encompass both learning through and about food. For example, in a grade two Swedish lesson, students created acrostic poems using vegetable names as part of a subject-integrated food education (Figure 4). Food functioned as a pedagogical tool to inspire writing and to express the character of a vegetable, exemplifying learning through food. Each word had to describe the characteristics of a specific vegetable. For example, one student chose the Swedish word *gurka* ("cucumber" in

<sup>16</sup> Additional data not included in the paper.

English) and then wrote a poem using the following adjectives (Field Note 40)<sup>17</sup>:

*God* [Tasty]

*Underbar* [Delicious]

*Rak* [Straight]

*Krispig* [Crispy]

*Avlång* [Oblong]

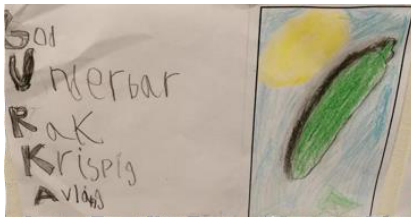


Figure 4. Student's cucumber poem illustrating food-related learning.

Furthermore, the importance of observing the visual characteristics of fruits and vegetables was emphasized through learning tasks in art and mathematics. Students learned to observe the uniqueness of different foods by identifying, comparing, drawing, and arranging them on fuse beads.

## Food-Related Learning Moments

The findings in Paper IV revealed that food-related learning moments among early primary school students were student-driven, collaborative, or teacher-driven (Table 7).

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<sup>17</sup> Additional data not included in the paper.

Table 7: Overview of the study results in Paper IV.

<b>Research question</b>	<b>Theme</b>
What kinds of food-related learning moments emerge during lessons designed to promote subject-integrated food education?	Exploratory learning moments
	Collaborative learning moments
	Non-negotiable learning moments

Additionally, the findings highlight the importance of a confident and skilled teacher in food education in early primary school. The teacher, as a food educator, had to recognize and respond accurately to emerging food-related learning opportunities both inside and outside the classroom. Recognizing and capturing food-related learning moments as they occur requires knowledge and skills to respond meaningfully to students' playful reflections and questions. These moments also underscore the role of language as a pedagogical tool. In addition, balancing students' playfulness with teaching was shown to be necessary, depending on the food-related content. Likewise, the teacher's ability to guide students' imaginative questions and reflections proved invaluable in supporting the students' food-related learning.

## Summary of the Results

When summarizing the results of the four papers, key aspects of subject-integrated food for food-related learning across different educational levels emerge (Figure 5).

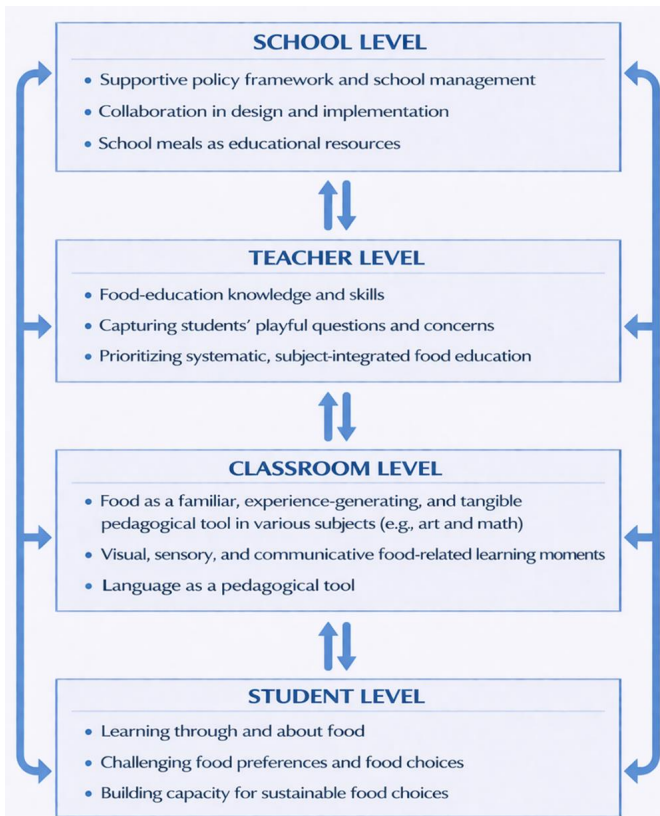


Figure 5: Key aspects of subject-integrated food education.

These key aspects of subject-integrated food for food-related learning are further discussed in the Discussion of Results section (p. 45-50).



# Discussion

## Methodological Considerations

The methodological design of this thesis is qualitative, focusing on words and observations (Adler, 2022). Rather than aiming for statistical generalization, the study seeks to explore and understand the case, generating theoretical insights from rich, contextually grounded data (Thomas, 2011). By employing a case study design, the triangulation of data sources strengthens the trustworthiness of the research (Coe et al., 2025). Although only a single case was examined, it was appropriate because its procedures for working with subject integration were well developed, allowing greater analytical focus on food education. In contrast, a different case might place greater emphasis on subject integration itself. In case study research, a single case can be justified by its uniqueness or significance, even though it is more limited in scope (Yin, 2018).

Furthermore, the thesis draws on a sociocultural perspective, viewing learning as social, situated, and mediated by tools (Säljö, 2022; Vygotsky, 1978). From this theoretical stance, students' learning outcomes cannot be directly observed; instead, their food-related learning processes can be followed through classroom observations. The observed lessons were selected to represent subject-integrated food education, the participating teachers, and the designed learning tasks. They were not intended to cover every lesson, as having only one observer imposed certain limitations. Lessons observed by different researchers might have generated different data; however, this does not imply that the collected and compiled data are irrelevant or uninformative or that similar patterns would not have emerged in another context. Moreover, each school context is unique in terms of its environment, teachers, and students.

The classroom observations typically involved the researcher being present in the classroom, and an observation manual was used to systematize the observations (Coe et al., 2025). The author's role alternated between facilitator, participating observer, and researcher, which provided valuable insights while requiring careful balancing between engagement and analytical distance—or participation and observation—but with data collection as the primary focus (Baker, 2006).

In the role of participating observer, the researcher focused on food-related learning moments and classroom dynamics, asked questions to both teachers and students, and showed interest in students' work. Although data collection was prioritized over active participation, the observer remained attentive to maintaining a relaxed and inclusive classroom environment accessible to all students, not only those directly involved in the research.

In addition, the selected quotations were chosen based on their relevance to the research questions. Initially, quotations were selected because of their connection to the overall research aim and the observation manual. Subsequently, specific quotations were included in the Results section because they represented the themes with which they were associated. All selected quotations illustrate snapshots of specific moments while also representing patterns of shared meaning consistent with reflexive thematic analysis (Braun & Clarke, 2019).

It was difficult to schedule and structure lessons when only students with parental consent could participate. Therefore, field notes played an essential role in capturing contextual and relational dimensions of classroom interaction. The use of video data from the observations can provide valuable insights. However, they also pose organizational challenges—such as grouping students—and ethical challenges—including the risk of students feeling monitored (Bohm & Lindblom, 2024). In this study, given the more than three-week interval between observations, organizing groups based on participation was neither realistic nor desirable. The subject-integrated food education needed to be accessible to all students. Therefore, the video data were used only as a supplement to support the field notes. Without video data, some detailed behavioral information was lost, along with support for memory; however, descriptive field notes were transcribed verbatim (Baker, 2006; Kocaman, 2024) immediately after each lesson to ensure precision.

While the data collected from student evaluation sessions were limited and not very nuanced, often expressed simply as good or less good, they nevertheless offered valuable insights into students' curiosity and engagement. During the evaluation with the teachers, the focus was primarily on subject-integrated food education, whereas the co-design process itself could have been evaluated more thoroughly.

From a dependability perspective, a key strength of the study is the clearly documented co-design process (Ahmed, 2024; Nowell et al., 2017). Moreover, the research context is well described without revealing the identity of the participants or the research sites, which supports the transferability of the findings and enables the replication of a similar study (Ahmed, 2024). Limitations of the

co-design process may arise from the differing goals of teachers and researchers, such as prioritizing teacher collaboration versus research objectives, together with the time-intensive nature of the entire co-design process. Ideally, subject-integrated food education should occur over a longer period and function as a recurring element throughout the school year rather than as a project-like activity.

The COVID-19 pandemic delayed data collection and affected morale; some teachers left their positions and were replaced during the process. Similarly, school management underwent changes during the research period. However, the same school staff participated throughout the co-design process.

In terms of trustworthiness, confirmability, and potential bias, the author's professional background inevitably shaped the observation field notes (Braun & Clarke, 2019; Kocaman, 2024) and the interpretation of the data (Creswell, 2014). Another researcher might have interpreted the data differently. On the other hand, the authors' extensive experience as teachers in home economics education provided valuable insights into the fieldwork, including, for instance, an interdisciplinary view of food education across social, natural, and cultural dimensions. In contrast, the author's prior experience of teaching lower secondary school students (grades five to nine, aged 11–15 years), in comparison with the early primary school students in the research, could be regarded as both a limitation (due to less familiarity with younger learners) and an advantage (owing to greater analytical distance). Although the researcher's educational background may have led to certain observations being taken for granted, measures were taken to mitigate this potential bias. During the fieldwork, alongside the use of an observation manual, the author documented the co-design process daily to enable reflexivity, gain perspective, and enhance research trustworthiness (Kocaman, 2024). Also, collaboration within the research team (peer debriefing) strengthened the trustworthiness of the analysis. The first author played an active role in data collection and in generating and developing themes, while all three authors engaged in critical discussions to refine interpretations and ensure alignment with the research questions.

Future studies should include a student perspective in subject-integrated food education from the design phase, as this could improve student engagement and provide insight into food choices and learning processes.

## Discussion of Results

Throughout the research, food served as a pedagogical tool within the co-design process of exploring, implementing, designing, and evaluating subject-integrated

food education. Moreover, several collaborative student learning processes related to food were observed in the classroom context.

The sociocultural perspective was evident in the findings, reflected in the roles of food, peer interaction, and language as mediating tools (Säljö, 2022; Vygotsky, 1978), as well as in student activity during learning tasks, particularly those involving tangible objects. Collaborative learning or learning in dialogue in the classroom context and students' imaginative questions also illustrated this perspective. Situated learning was also evident in the way teachers captured spontaneous learning moments that arose from students' questions.

However, some aspects were less prominent. Students engaged relatively little in practical food-related skills, stayed uninvolved in the creative design of food education, and demonstrated limited "thinking together" in problem-solving activities. The sections below will further discuss the results of the thesis.

## A School Culture Supportive of Food Education

The main findings highlight that a supportive school culture for food education relies on organization support and integration, for example, scheduling time for learning tasks and opportunities for collaboration (Papers I and II). The findings also highlighted the importance of a structured approach to food education (Papers I and II), for example, through a recurring and established place in the school year cycle. The importance of an organizational structure that supports integration has also been reported by Bohm (2022), Haapaniemi et al. (2019), and Lindblom et al. (2020).

When subject-integrated food education was designed through co-design sessions, time constraints were less prominent than those reported in previous research (Haapaniemi, 2022; Kelly & Nash, 2021; Lindblom, 2016; Love et al., 2020).

Home economics education plays a central role in food education, yet its position in the school curriculum is limited and often introduced at a later stage (e.g. in Sweden, grades 6–9) of compulsory schooling. As a result, many early primary school students encounter structured food education only briefly, which restricts opportunities to develop knowledge, skills, and attitudes toward sustainable food practices at an early age. This underscores the need to strengthen food education earlier in schools and to view it as a shared educational responsibility across the school and its subjects.

One solution to the challenges explored in this thesis is to strengthen food education in early primary school through a subject-integrated food education

approach. In this approach, food-related themes are embedded across multiple school subjects, such as science, social studies, and language education. This approach enables a more comprehensive engagement with food as a multifaceted cultural, social, and environmental phenomenon. However, subject integration may also present challenges, including differences in teacher competence and confidence in food education, limited planning opportunities, and perceptions of a crowded curriculum. Furthermore, food education in early primary school faces challenges competing with academic demands, insufficient teacher education, and a lack of resources (Love et al., 2020). Addressing these challenges requires a combination of structural support, including policy, management, and resources, as well as pedagogical strategies. These strategies may include sensory-based food education (Dazeley et al., 2012; Kähkönen et al., 2018; Mustonen et al., 2009; Mustonen & Tuorila, 2010; Reverdy et al., 2008, 2010) and subject integration, in order to fully realize the potential of food education in schools. The development of subject-integrated food education in early primary school necessitates prioritizing food education among the school staff. Collaboration between teachers, school meal staff, and school management is essential for creating coherent learning environments that make food education visible and meaningful throughout the school day. In addition, the involvement of a facilitator can further strengthen teachers' knowledge and skills in food education and support subject-integrated food education. By working collaboratively and strategically within a food-education-supportive school culture (Bryant et al., 2023; Shallcross, 2006) that values food-related learning, schools can offer food education as an integrated, engaging, and sustainable learning experience across several subjects, starting in early primary school.

## Qualified Teachers

The findings highlighted the importance of teachers' food education knowledge and skills (Papers I–IV), their prioritization of food education, collaboration in subject-integrated food education, and the role of a facilitator in food education (Paper I). Furthermore, recognizing the need for food education in early primary school, teachers reported a lack of supporting tools (Paper II). The findings also emphasized the importance of adopting a playful approach to food education that aligns with students' curiosity and reflective questions (Paper IV). Learning opportunities in food education are often situated, context-dependent, and may arise unexpectedly (Paper IV). These findings reflect the importance of food education within teacher education programs (Ballam, 2021; Gisslevik et al., 2017;

Stapleton, 2022), the lack of resources for food education identified by Love et al. (2020), and the role of the food educator in balancing the normative dimensions of food education (Berg et al., 2022; Bohm, 2023; Gelinder & Hjalmskog, 2025; Håkansson, 2015; Weiser et al., 2026).

Research in food education indicates that sustainability and food choice are complex topics in schools (Haapaniemi et al., 2022; Weiser et al., 2026). To engage students, food educators need to use non-normative and reflective approaches, focusing on positive and inclusive food messages (Stok et al., 2016; Berg et al., 2022; Bohm, 2023; Gelinder, 2020; Gelinder & Hjalmskog, 2025). However, a skilled and playful food educator was found to be essential in recognizing and responding to spontaneous food-related learning moments in early primary school. At the same time, teachers need to balance students' playful approaches with more serious, research-based, and non-normative responses to their curious food-related questions, ensuring that food education remains both meaningful and accurate.

Students ultimately decide what to eat from the available options, bringing a variety of food experiences with them. Their food choices are influenced not only by sustainability considerations but also by factors such as taste and peer influence (Janhonen, 2016). A qualified food educator understands the complexity of students' food choices through the integration of multiple perspectives, including social, cultural, and nutritional, to support sustainable food choices. For instance, it includes using the potential of school meals as educational resources to challenge students' food choices, promote sustainable eating, and introduce new flavors and vegetables. Teachers acting in the role of food educators during mealtimes, sharing discussions about food and sustainability, can turn everyday eating experiences into valuable learning opportunities. Except for food-related knowledge and skills, teachers' competence encompasses critical thinking and an understanding of food systems (Renwick & Powell, 2019), enabling them to address education for sustainable food choices.

Teachers' self-efficacy in food education, as well as their willingness to prioritize food education, are crucial for the integration of food education. The findings also highlight the importance of supporting early primary school teachers in their roles as food educators and providing them with the competence and confidence to integrate food education across subjects. Teacher education programmes, therefore, ought to equip all early primary school teachers with the knowledge, skills, and confidence required to strengthen qualifications in food education and enable them to identify and use food-related moments to support students' learning.

## Food as a Pedagogical Tool

Early primary school students are often playful and curious. Through play and creative exploration, students expand their understanding of their experiences (Lindqvist, 2003; Vygotsky, 2016). Furthermore, interaction, communication, and active participation form the basis of students' learning and development (Säljö, 2022; Vygotsky, 1978).

Regarding student playfulness, findings related to food as a pedagogical tool showed that it offers opportunities to inspire, motivate, and engage students through its familiarity, its capacity to generate experiences, and its tangible nature (Paper II). The findings also emphasized students' communication of sensory experiences when eating fruits and vegetables, teachers' communication about food and health, students' structuring of information into food groups, and observation of the visual characteristics of fruits and vegetables (Paper III).

Food as a pedagogical tool aligns with previous research that highlights the educational potential of food (Beinert, 2021; Beinert et al., 2021a; Berg et al., 2023; Bohm, 2022; Haapaniemi et al., 2022; Höjjer et al., 2011; Palojoki, 1997; Sepp & Höjjer, 2016). In addition, the sociocultural perspective emphasizes the role of mediating tools in learning (Säljö, 2022; Vygotsky, 1978).

The findings related to the familiarity of food have also been reported by Haapaniemi et al. (2022), Höjjer (2013), and Palojoki (1997). Furthermore, the benefits of sensory-based food education for increasing interest in food choices have been identified (Dazeley et al., 2012; Gelinder et al., 2020; Kähkönen et al., 2018; Mustonen & Tuorila, 2010; Reverdy et al., 2008, 2010), while the importance of food's tangibility has been emphasized by Höjjer et al. (2011) and Stapleton (2022).

From a sociocultural perspective, learning is viewed as mediated by cultural tools (Eun, 2019; Säljö, 2022; Vygotsky, 1978). In food education, this implies that food can function as a pedagogical tool that makes learning tangible, experiential, and familiar. Starting from a familiar context, such as food, can motivate learning and facilitate understanding (Haapaniemi et al., 2022; Höjjer, 2013). Using food as a pedagogical tool enables students to connect theory and practice through sensory and emotional experiences in an exploratory manner. By providing opportunities for students to experience, taste, discuss, and identify different fruits and vegetables and to become familiar with previously unknown foods, such as parsnips, the students were able to build their food-related experiences.

Furthermore, because early primary school students are still developing foundational literacy and numeracy skills, food can serve as an engaging and motivating resource in this process (Haapaniemi et al., 2022). Unlike many other pedagogical tools, food is edible, colorful, and aromatic, making learning multisensory, which can also be experienced as engaging by the students.

## Learning through and about Food

The findings show that learning *through* food offers opportunities to integrate subject knowledge with everyday experiences, thereby supporting language development, mathematical reasoning, and collaborative thinking. In addition, learning *about* food contributes to the development of students' critical and reflective food-related understanding (Paper III) through age-appropriate food education (Ares et al., 2023). For instance, one student asked whether rhubarb is difficult to classify as either a fruit or a vegetable<sup>18</sup> and sought to discuss this with the teacher. Interpreted through the lens of the zone of proximal development (Eun, 2019; Säljö, 2022; Vygotsky, 1978), this finding suggests that food-related learning in early primary school often takes place between what students can do independently and what they can learn through guided interaction (Rogoff, 1995). A food educator can recognize and build on these context-dependent moments by responding to students' questions and curiosity, allowing food-related learning to emerge naturally within specific social and classroom situations.

In this sense, interactive food education, involving students' playful approaches and supported by attentive food educators, promotes food-related learning processes related to sustainable food choices.

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<sup>18</sup> Field Note 22.

# Conclusions

In contexts where home economics education is not provided in early primary school, subject-integrated food education enables learning through food and about food. To reach the potential of subject-integrated food education and to overcome challenges related to a crowded curriculum, limited teacher planning time, and insufficient food-related knowledge and skills, aspects at the societal, school, and student levels need to be considered.

At the societal level, subject-integrated food education introduced in early primary school aligns with efforts to promote students' sustainable food choices. Furthermore, food-related learning aligns with national public health goals related to equity in health (Commission for Health Equity, 2017) as well as with international frameworks such as the World Food Programme (2023) and the United Nations' global sustainability goals (United Nations, 2015). Thus, developing an understanding of subject-integrated approaches during teacher education programs may support future teachers and school leaders in adopting such practices. Moreover, including elements of subject-integrated food education in teacher and head teacher education programs may help establish food education as a component of early primary schooling, which is an important phase of students' food choices development. Furthermore, explicit formulations of food education across school subjects in the national curriculum could facilitate collaboration among teachers and support subject-integrated food education, including the use of school meals as an educational resource.

At the school level, supportive school management, further education in using food as a pedagogical tool, and collaboration between teachers and school meal staff need to be ensured. Students' food-related learning should be understood as part of a lifelong process of knowledge development rather than as a time-limited intervention within a single school project. The use of co-design can support a collaborative, research-informed working model in which teachers jointly explore, design, implement, and reflect on the use of food as a pedagogical tool and on food-related learning. However, initiating food-related learning processes often requires a facilitator with food-related

knowledge and skills, which align with the competencies of teachers in home economics education. Broad subject integration, including the use of school meals as educational resources, can enhance collaboration among teachers and school meals staff. The findings show that subject-integrated food education in early primary school can be deeply social and communicative, sensory-based, and contextually situated through students' curious questions. Using food as a pedagogical tool can contribute to subject-specific knowledge across several subjects by strengthening subject character and making learning more dynamic and connected to students' everyday lives. Additionally, food as a pedagogical tool combines familiarity with sensory experience, stimulating students' curiosity, engagement in collective thinking, and shared meaning-making, thereby supporting food-related learning and development.

Finally, at the student level, the understanding and development of knowledge and skills in subjects such as art, mathematics, or language can be enhanced by using food as a tangible, experience-generating, and familiar pedagogical tool. In addition, learning through food as well as learning about food has the potential to challenge students' subject-specific knowledge, influence their food preferences, and empower them to make active, informed food choices shaped by social, cultural, and environmental considerations.

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*It takes a village to write a thesis.*

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*Louise Hård*

May 2026



# Sammanfattning på svenska

Elevers matrelaterade kunskaper och färdigheter har potential att påverka deras matval och därigenom deras hälsa och välbefinnande över tid. I Sverige behandlas undervisning om hållbara matval traditionellt i grundskolans senare år, medan ämnet hem- och konsumentkunskap introduceras i årskurs 6 (vid 12 års ålder). Samtidigt uppstår matrelaterade frågor och reflektioner redan hos elever i de tidiga skolåren.

Syftet med avhandlingen är att undersöka användningen av mat som pedagogiskt verktyg i de tidiga skolåren genom en co-designprocess av ämnesintegrerad matundervisning, med målet att främja elevers matrelaterade lärande.

I denna doktorsavhandling undersöks co-designad ämnesintegrerad matundervisning ur flera perspektiv, inklusive lärares initiala uppfattningar om ämnesintegrerad matundervisning, co-designprocessen samt den genomförda undervisningen ur både undervisnings- och lärandeperspektiv.

Den övergripande metodologiska ansatsen i forskningsprojektet var en kvalitativ fallstudie. En co-designprocess användes för att utforska, designa, genomföra och utvärdera ämnesintegrerad matundervisning i de tidiga skolåren (elever i åldrarna 6–9 år). Studien är förankrad i ett sociokulturellt perspektiv, som ramar in det teoretiska angreppssättet och analysen. Data samlades in genom enkäter, intervjuer, deltagande observationer samt fältanteckningar från co-designsessioner och klassrumsobservationer.

Resultaten visar på betydelsen av en matstödande skolkultur, kännetecknad av organisatoriska strukturer som möjliggör samarbete mellan skolans personal och avsätter tid för planering av matrelaterade läraktiviteter. Lärares matrelaterade kunskaper och färdigheter, liksom en facilitator för ämnesintegrerad matundervisning, framstod som avgörande faktorer.

Resultaten visar även att mat, som ett välbekant, konkret och erfarenhetsbaserat pedagogiskt verktyg, stödde både lärande *genom* mat och lärande *om* mat, och bidrog därigenom till elevers matrelaterade lärande. Användningen av mat som pedagogiskt verktyg uppmuntrade även matrelaterad kommunikation, strukturering av information samt observation av frukt och grönsakers visuella egenskaper. Vidare identifierades

utforskande, samarbetsinriktade och icke-förhandlingsbara matrelaterade lärandemoment under lärprocesserna. Dessa resultat belyser vikten av en kompetent matpedagog som uppmärksammar och tar vara på elevers matrelaterade och bitvis lekfulla initiativ samt anpassar undervisningen till elevers intressen och kunskapsnivåer.

Sammanfattningsvis visar avhandlingen att ämnesintegrerad matundervisning i de tidiga skolåren gynnas av organisatoriskt stöd från skolledningen, samarbetsinriktade arbetsätt samt pedagoger med matrelaterade kunskaper och färdigheter. Resultaten har implikationer för lärarutbildning och skolledning och betonar behovet av professionell kunskap och organisatoriska strukturer som stödjer ämnesintegrerad matundervisning i tidiga skolår.

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# Appendices [In Swedish]

## *Appendix A. Teacher information and consent for participation*

### **GÖTEBORGS UNIVERSITET INSTITUTIONEN FÖR KOST- OCH IDROTTSVETENSKAP**

#### **INFORMATION OM MEDVERKAN I FORSKNINGSPROJEKT MAT SOM PEDAGOGISKT VERKTYG**

Er skolas årskurs F-5 kommer under höstterminen 2022 att delta i forskningsprojektet *Mat som pedagogiskt verktyg* som genomförs av Göteborgs universitet. Syftet med forskningen är att utforska mat som pedagogiskt verktyg genom att utveckla och implementera undervisnings- och lärandemöjligheter genom ämnesintegrerad matundervisning. Lärare och forskare kommer tillsammans att utforma undervisningen som därefter genomförs och utvärderas. Metoder som kommer att användas för datainsamling är enkät, intervjuer och observation/videoinspelade lektionsmoment. Insamlat datamaterial avser inte känsliga personuppgifter men kommer att anonymiseras och förvaras säkert, samt sparas enligt Arkivlagen. Datamaterialet kommer att ingå i en doktorsavhandling och presenteras muntligt och skriftligt i vetenskapliga artiklar utan att skolan eller medverkande lärare eller elever kommer att kunna identifieras.

Ditt deltagande är frivilligt och det är möjligt att när som helst avbryta ditt deltagande utan att behöva ge någon förklaring genom att kontakta någon av oss via kontaktuppgifterna nedan. Göteborgs universitets är personuppgiftsansvarig och dataskyddsombud kan kontaktas via epost: [dataskyddsombud@gu.se](mailto:dataskyddsombud@gu.se) eller 031-786 00 00 (växel). Ändamålet med behandlingen av personuppgifterna är att genomföra forskningsprojektet *Mat som pedagogiskt verktyg*. Den rättsliga grunden styrs genom 1. Att forskning vid GU har allmänt intresse (GDPR 6.1), och 2. Att behandlingen av känsliga personuppgifter är nödvändig för vetenskapligt forskningsändamål och sker enligt etikprövningslagen (GDPR 9.2). Du har rätt att få personuppgifter rättade eller raderade samt att få behandlingen av uppgifterna begränsad. Du har även rätt att lämna klagomål till Datainspektionen.

Tveka inte att ta kontakt med oss om du har några frågor om forskningsprojektet!

Med vänliga hälsningar,

Louise Hård, doktorand i kostvetenskap, Göteborgs universitet,  
e-post [louise.olsson.hard@gu.se](mailto:louise.olsson.hard@gu.se), tel: 031-7862495

Huvudansvarig forskare: Christel Larsson, professor i kostvetenskap, Göteborgs universitet,  
e-post: [christel.larsson@gu.se](mailto:christel.larsson@gu.se), tel: 070-9116519

**SAMTYCKE TILL ATT DELTA I FORSKNINGSPROJEKTET "MAT SOM PEDAGOGISKT VERKTYG"**

Jag har fått muntlig och/eller skriftlig information om studien och har haft möjlighet att ställa frågor. Jag får behålla den skriftliga informationen.

- Jag samtycker till att delta i forskningsprojektet *Mat som pedagogiskt verktyg*.

Plats och datum	Underskrift
	Namnförtydligande

## Appendix B. *Student information and consent for participation*

### INFORMATION OCH FÖRFRÅGAN OM ATT MEDVERKA I EN PRAKTIKNÄRA SAMVERKANS-FORSKNINGSSTUDIE OM MAT SOM PEDAGOGISKT VERKTYG

Er skola samarbetar med forskare vid Göteborgs universitet i en praktiktäna forskningsstudie om mat som pedagogiskt verktyg. Studien beskriv nedan och vi undrar om ditt/dina barn som går i förskoleklass eller årskurs 1-3 ställer sig positiv till att medverka i studien?

**Du svara på frågan genom att fylla i formuläret på sista sidan!**

#### **Vad går studien ut på?**

Vi är intresserade av att undersöka lärandemöjligheter med *Mat som pedagogiskt verktyg* genom att planera, genomföra och utvärdera ämnesintegrerad matundervisning i samverkan med lärare vid er skola.

#### **Vem kan delta och vad innebär en medverkan?**

Studien vänder sig till elever som går i förskoleklass eller årskurs 1-5. Eleverna kommer att få ta del av ämnesintegrerad matundervisning inom olika skolämnen med syfte att konkretisera innehåll, engagera samt lärande om hållbara matval. Delar av lektioner kan komma att observeras och videoinspelas för att få följa matundervisning och lärprocesser. Eleverna kommer även bli tillfrågade att delta i intervjuer om hur de upplever matundervisningen.

#### **Hur kommer informationen som samlas in hanteras?**

All information som samlas in i studien kommer att hanteras konfidentiellt dvs utan att någon obehörig får kännedom, och under dataanalyser kommer varje deltagare anonymiseras genom att ges ett deltagarnummer. Resultaten från denna studie kommer att presenteras utan att kunna spåras till en enskild deltagare eller medverkande skola. Se mer information om ”Konfidentialitet, personuppgiftshantering och GDPR” på nästa sida.

**Går det att avbryta medverkan i studien?**

Elever som ställer sig positiva till att medverka i studien kan när som helst, utan att behöva ange varför, välja att avbryta sin medverkan helt eller delvis utan att detta ifrågasätts och utan att det kommer att medföra några negativa konsekvenser. Elever kan även välja att tacka nej till att medverka helt eller i delar av studien trots att ni har svarat ja i svarsformuläret.

**På nästa blad finns ett svarsformulär som du fyller i oavsett om ditt barn ställer sig positivt eller ej till att medverka och som du skickar tillbaka till oss i det bifogade förfrankerade kuvertet!**

Om ni har några frågor är ni varmt välkomna att höra av er till oss!

.....  
**Ansvarig för studien:** Professor Christel Larsson, e-post: [christel.larsson@gu.se](mailto:christel.larsson@gu.se),  
tel. 0709116519

**Kontaktperson:** Doktorand, Louise Hård, e-post: [louise.olsson.hard@gu.se](mailto:louise.olsson.hard@gu.se),  
tel. 031-7862495

Institutionen för kost- och idrottsvetenskap, Göteborgs universitet

## Information om konfidentialitet, personuppgiftshantering och GDPR

Denna forskningsstudie följer Etikprövningsnämndens etiska riktlinjer. All information som samlas in i studien kommer att hanteras konfidentiellt och under dataanalyser kommer varje deltagare enbart att identifieras med ett deltagarnummer. Resultaten från denna studie är tänkta att publiceras i vetenskapliga tidskrifter och som en del av en doktorsavhandling. Forskningsmaterial som studien ger kommer att presenteras utan att kunna spåras till enskilda deltagare eller medverkande skola.

Era svar och personuppgifter i studien kommer att förvaras i ett brand- och stöldsäkert utrymme och behandlas så att inte obehöriga kan ta del av dem. Elektroniska uppgifter sparas i universitetets molntjänst med hög säkerhet. Personuppgiftsansvarig är Göteborgs universitet. Angående frågor om personuppgifter och dataskydd i studien är ni välkomna att vända er till oss forskare och är det frågor vi inte kan svara på hänvisar vi till Göteborgs universitets dataskyddsombud som du kan nå via e-post: [dataskyddsbud@gu.se](mailto:dataskyddsbud@gu.se), eller telefon: 031-786 00 00.

Deltagare har vid missnöje alltid rätt att vända sig med synpunkter till tillsynsmyndigheten Integritetsskyddsmyndigheten (före detta Datainspektionen). Den rättsliga grunden för hantering av personuppgifter i denna forskningsstudie är samtycke. Ändamålet med behandlingen av personuppgifterna är att genomföra forskningsstudien 'Mat som pedagogiskt verktyg' och den rättsliga grunden styrs genom 'Att forskning vid GU har allmänt intresse' (GDPR 6.1).

Personuppgifter (ljud-/videoinspelning) hanteras med omsorg om deltagarnas integritet och på ett sätt som följer EU:s dataskyddsförordning (GDPR). Personuppgifter kan komma att lagras under hela forskningsprojektets gång, upp till 10 år, innan de raderas. Enligt GDPR har forskningsdeltagare rätt att gratis begära ut de personuppgifter som finns registrerade rörande den egna personen, samt att få uppgifterna rättade, raderade eller få behandling av uppgifterna begränsad. Om du vill ta del av uppgifterna så kontaktar du ansvarig forskare Christel Larsson via e-post: [christel.larsson@gu.se](mailto:christel.larsson@gu.se), post: Box 300, 405 30 Göteborg, telefon: 070-9116519.

### Svarsformulär för deltagande i Mat som pedagogiskt verktyg-studien

Jag har läst och förstår informationen om forskningsprojektet. Jag har fått veta att mitt barns deltagande är frivilligt och kan avbrytas när som helst utan förklaring eller negativa konsekvenser. Jag har också fått möjlighet att ställa frågor och få svar.

Samtliga vårdnadshavares underskrift krävs för medverkan.

Barnets namn: \_\_\_\_\_

Klass: \_\_\_\_\_

Jag ger mitt **samtycke** till att mitt barn ställer sig positivt till att delta i studien om mat som pedagogiskt verktyg.

Jag samtycker **inte** att mitt barn deltar i studien om mat som pedagogiskt verktyg.

Vårdnadshavare 1

Plats och datum	Underskrift
	Namnförtydligande

Vårdnadshavare 2 alternativt  Finns endast en vårdnadshavare.

Plats och datum	Underskrift
	Namnförtydligande

**Lämna in svarsformuläret (detta papper) till din lärare senast fredag 28 oktober,** eller skicka samtycke med e-post: [louise.olsson.hard@gu.se](mailto:louise.olsson.hard@gu.se)

## Appendix C. *Teacher questionnaire*

GÖTEBORGS UNIVERSITET  
INSTITUTIONEN FÖR KOST- OCH IDROTTSVETENSKAP  
2022-06-01



### ENKÄT SKOLPERSONAL

*Vänligen besvara följande frågor utförligt och vid behov kan du fortsätta skriva svaren på baksidan.*

#### 1) **Tänk på *mat som pedagogiskt verktyg*.**

- a) Hur kan *mat som pedagogiskt verktyg* användas vid er skola?
- b) Hur kan *mat som pedagogiskt verktyg* användas i din undervisning/ditt arbete?

#### 2) **Tänk på *möjligheter och utmaningar med att använda mat som pedagogiskt verktyg*.**

- a) Vilka *möjligheter* ser du med att använda *mat som pedagogiskt verktyg* i din undervisning/ditt arbete?
- b) Vilka *utmaningar* ser du med att använda *mat som pedagogiskt verktyg* i din undervisning/ditt arbete?

#### 3) **Tänk på *hållbarhet och miljö* samt *hälsa och välmående*.**

- a) Hur kan din undervisning/ditt arbete bidra till elevers lärande kring *hållbarhet och miljö*?
- b) Hur kan din undervisning/ditt arbete bidra till elevers lärande kring *hälsa och välmående*?

#### 4) **Tänk på forskningsprojektet *Mat som pedagogiskt verktyg* vid er skola.**

- a) Vilka *förväntningar* har du på vad din medverkan i projektet ska leda till?
- b) Vilka *önskemål* har du om vad din medverkan i projektet ska leda till?

#### 5) **Vill du tillägga något?**

#### 6) **Din bakgrund**

*Välj det/de alternativ som stämmer överens med din utbildning och erfarenhet.*

- a) Vad har du för utbildning?

- Jag är lärarstudent
- Jag är utbildad klasslärare och/eller ämneslärare i följande ämne/n:
- Jag är inte utbildad lärare
- Jag har annan kompetens, såsom:
- Jag vill inte uppge

b) Hur många års yrkeserfarenhet har du (VFU och/eller vikariat inkluderat)?

- < 1 år
- 1 - 2 år
- 2 - 5 år
- 5 - 10 år
- > 10 år

**7) Skulle du kunna tänka dig att medverka i en gruppdiskussion om hur mat som pedagogiskt verktyg skulle kunna utformas?**

- Ja
- Eventuellt
- Nej

Om ja eller eventuellt, uppge ditt namn:

De ämnen du undervisar i/ditt uppdrag:

Mejladress:

**TACK FÖR DINA SVAR!**

Louise Hård  
Doktorand,  
Institutionen för kost- och idrottsvetenskap  
Göteborgs universitet  
louise.olsson.hard@gu.se

## Appendix D. *Teacher interview guide*

### INTERVJUFRÅGOR LÄRARE

- **Lugn miljö**
- **Informerat samtycke.**
- **Tillåtelse att avbryta intervjun när som helst.**
- **Tillåtelse till ljudupptagning.**

Frageställning: Vilka erfarenheter har lärare av ämnesintegrerad undervisning, och vilka möjligheter och utmaningar ser de med att genomföra ämnesintegrerad matundervisning?

#### 1) **Mat som pedagogiskt verktyg**

- a) Vad har du för **erfarenheter** av att arbeta ämnesintegrerat?
- b) Beskriv din **erfarenhet av undervisning om bra mat**: områdesarbete eller enskilda lektioner.
- c) Vad anser du att **elev**er behöver lära sig om bra mat? Förklara.
  - a) Vad är din tolkning av begreppet **Mat som pedagogiskt verktyg**?
  - b) Vilka **möjligheter** ser du med **Mat som pedagogiskt verktyg**?
  - c) Hur skulle du beskriva **dina kunskaper** om hållbar och hälsosam mat idag?
  - d) Hur kan **din undervisning bidra till lärande om hållbar och hälsosam mat**?
  - e) Hur kan **Mat som pedagogiskt verktyg engagera och/eller motivera elever i din undervisning**?
  - f) Vilka **utmaningar** kan du se med **Mat som pedagogiskt verktyg**?

#### 2) **Områdesarbete X**

- g) Ge ett **namnförslag (X)** på kommande områdesarbete om hållbar och hälsosam mat.
- h) Vilka **lektionsupplägg** inom områdesarbete X kan du se? Både generellt och i din undervisning.
  - i) Under hur lång **tid** borde områdesarbete X pågå?
  - j) Hur kan vi använda **annan personal** på skolan i projektet?
  - k) Hur får vi **fler lärare/lärare från äldre stadier att vilja delta** i områdesarbetet **Mat som pedagogiskt verktyg**?
  - l) Har du något övrigt du vill tillägga?

#### 3) **Om dig som lärare**

- Ditt **namn**?
- a) Vilket **arbetslag** tillhör du?
  - b) Vad har du för **utbildning**?

- c) Vilka **ämnen** undervisar du i?
- d) I vilka **årskurser** undervisar du?
- e) Hur **länge** har du arbetat på skolan?

## Appendix E. *Observation manual*

### OBSERVATIONSMANUAL

**Datum:** \_\_\_\_\_ **Tid:** \_\_\_\_\_

**Klass:** \_\_\_\_\_

**Lärare:** \_\_\_\_\_

**Innehåll:** \_\_\_\_\_

Sociokulturella aspekter (verktyg/aktivitet/kontext)	Undervisningssätt	Aktivt deltagande elever Individuellt arbete Arbete i grupp Problemlösning i grupp
	Artefakter för lärande	Lärobok Teknik Livsmedel Andra resurser
	Lärande relationer	Mänskliga resurser som lärare eller elev
Lärarens språk som medierande redskap Mat som pedagogiskt		Anpassat språk och ton, blandning av konkret och abstrakt Uppmuntrar utmaningar och tillåter misstag För dialog Förklarande Tillåtande klassrumsklimat för kreativitet och kritiskt tänkande Öppna frågor, uppföljande frågor Inlyssnande Kroppsspråk
	Elevspråk	Elev-lärarsamtal Elev-elevsamtal Möjlighet till samarbete Tänker tillsammans Kroppsspråk Frågebehov
	Ämnesintegrering	Integrering med matundervisning som mål
		Integrering med kunskaper i respektive skolämne som mål
		Utgångspunkt i styrdokument
		Överblick Sammanhang Holistiskt lärande

		Flera perspektiv Intertänkande, att tänka tillsammans Kreativitet
		Val av tema för integrering
	Matundervisning	Utmana elevers smaker
		Mixad teori och praktik
		Positivt matbudskap
		Utgångspunkt i näringsrekommendationer
Lärandeprocess	Motiverade elever	Känslor Miner Kroppsspråk Tillåtande klassrumsklimat Möjlighet till kreativitet Dialog Mat som engagerande verktyg Möjlighet till inflytande Återkoppling
	Engagerade elever	Attityd Beteende Förväntningar Överraskningar Nyfikenhet Intresse
	Anpassningar	Kognitiva utmaningar Uppgifter och innehåll Utgå från elevers erfarenheter Utgå från elevers kunskaper

## Appendix F. *Evaluation guide*

### UTVÄRDERING SKOLANS SMAKKASSE/MAT SOM PEDAGOGISKT VERKTYG

*Rangordna bilderna med lektionsmoment från områdesarbetet enligt diamantmodell (ruter). Överst placerar ni den undervisningen ni uppskattade mest överst.*

#### Elever

- 1) Berätta om områdesarbetet Skolans smakkassen. Roligt, svårt, tråkigt...?
- 2) Berätta vad tyckte om du skolveckan med, frukttema? Grönsakstema? Matsvinnstema?
- 3) Har du provsmakat någon ny frukt eller grönsak? Gott? Mindre gott?
- 4) Hur tänker du kring matrester på din tallrik?
- 5) Något annat du vill säga?

#### Lärare

- 1) Berätta om din upplevelse av projektet Mat som pedagogiskt verktyg (planering/genomförande).
- 2) Vilka undervisningsmoment var nya för er/eleverna?
- 3) Vilka moment kändes extra meningsfulla/mindre meningsfulla?
- 4) När engagerade undervisningen eleverna?
- 5) När fungerade mat som pedagogiskt verktyg bra genom att bidra till lärande i olika ämnen?
- 6) När fungerade mat som pedagogiskt verktyg mindre bra?
- 7) Vilken ämnesintegrering var mest lyckad? Varför? Mindre lyckad?
- 8) Vilken typ av föräldrarespons har ni fått?
- 9) Vad skulle ni förändra om ni genomförde ett liknande områdesarbete igen?
- 10) Något annat ni vill tillägga?



Previous publications:

Editors: Kjell Härnqvist and Karl-Gustaf Stukát

1. KARL-GUSTAF STUKÁT *Läskolans inverkan på barns utveckling*. Stockholm 1966
2. URBAN DAHLÖF *Skoldifferentiering och undervisningsförlopp*. Stockholm 1967
3. ERIK WALLIN *Spelling, Factorial and experimental studies*. Stockholm 1967
4. BENGT-ERIK ANDERSSON *Studies in adolescent behaviour. Project Yg, Youth in Göteborg*. Stockholm 1969
5. FERENCE MARTON *Structural dynamics of learning*. Stockholm 1970
6. ALLAN SVENSSON *Relative achievement. School performance in relation to intelligence, sex and home environment*. Stockholm 1971
7. GUNNI KÄRRBY *Child rearing and the development of moral structure*. Stockholm 1971

Editors: Urban Dahllöf, Kjell Härnqvist and Karl-Gustaf Stukát

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15. LARS OWE DAHLGREN *Qualitative differences in learning as a function of content-oriented guidance*. Göteborg 1975
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21. JAN-ERIK PERNEMAN *Medvetenhet genom utbildning*. Göteborg 1977

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24. ANDERS FRANSSON *Att rädas prov och att vilja veta*. Göteborg 1978
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28. GUNNAR STANGVIK *Self-concept and school segregation*. Göteborg 1979
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38. BJÖRN HASSELGREN *Ways of apprehending children at play. A study of pre-school student teachers' development*. Göteborg 1981

39. LENNART NILSSON *Yrkesutbildning i nutidshistoriskt perspektiv. Yrkesutbildningens utveckling från skräväsandets uppbörande 1846 till 1980-talet samt tankar om framtida inriktning*. Göteborg 1981
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What we learn about food early in life can shape our health and well-being, as well as our impact on the environment. This thesis explores subject-integrated food education and how food can be used as a pedagogical tool for learning in early primary school. In a collaborative design process with teachers, new ways of integrating food into different school subjects were developed and implemented in the early years of compulsory school (for students aged 6–9 years). The findings show that food, as a pedagogical tool, can make learning more familiar, concrete, and experiential. In addition, food education in early primary school can encourage students' playfulness, curiosity, and food-related communication, supporting both learning through and about food. At the same time, successful subject-integrated food education requires supportive school structures, time, and a willingness to collaborate, as well as teachers with food education knowledge and skills. Overall, this research highlights the potential of introducing structured food education in early primary school, helping children develop food-related knowledge, skills, and awareness in promoting sustainable choices throughout life.



**Louise Hård** is a teacher in home economics and holds a master's degree in Health Science. Her research interests include food education, educational research, and didactics in home economics education.

