



“An unexploited potential”

LifeLab Food and Health: Assessment and Development of Teaching and Learning Practices in the Norwegian School Subject Food and Health

Cecilie Beinert

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Summary

Adhering to a healthy diet is key to a healthy life. Furthermore, investing in child and adolescent health has been highlighted as particularly important since it benefits the individual both now and long-term, as well as future generations. Based on this, schools have been identified as a crucial arena to reach this age group.

In Norway, the school subject termed Food and Health (FH) educates students in food and nutrition and how this is related to health. Still, there is concern students are not acquiring the competencies highlighted in the curriculum since the number of formally qualified in FH is the lowest among all school subjects. Also, FH classes today primarily focus on cooking and the development of students' cooking skills, leaving little time for more comprehensive FH education, which contributes to this concern.

The aims of this thesis were twofold: first, to map teaching practices in FH in Norway, at the national and school levels, with special emphasis on learning activities, teacher competence, and experiences among FH teachers and students in Norway; second, to develop and test different student-activating learning tasks aiming to strengthen comprehensive FH education.

This thesis has been based on four papers. In Papers I and II, an anonymous online questionnaire was developed and distributed to all primary and lower secondary schools in Norway to map FH teachers' teaching practices, formal competence, and experiences at the national level. In Paper III, focus group discussions (FGDs) with teachers and students were conducted to explore current teaching practices and their experiences of the subject at the school level. The findings from these FGDs, together with the literature on pedagogics, were then used to develop the learning tasks. Finally, for Paper IV, the developed learning tasks were tested at three schools recruited for the project using video recording and observation to collect data.

Regarding the first aim of this thesis, with its focus on the use of learning activities, Paper I examined the use of activities in which students are encouraged to use their senses, digital tools, exploratory/experimental activities, and flipped

classroom. It further explored FH teachers' perceptions of important barriers and promoters of learning and teaching in FH. In total, 1170 FH teachers completed the questionnaire. Results show that around 80% of the time teaching FH was dedicated to practical cooking. The use of different activities varied, from 14% (flipped classroom) to 71% (sensory tasks). Regarding learning in FH, all teachers believed engaged teachers were important for learning, followed by lots of practical cooking and necessary equipment (99%). Among barriers to good teaching, lack of equipment (97%), non-optimal premises (96%), and economic factors (94%) were the three most important factors.

Also within the first aim of this thesis, and focusing on teacher competence, Paper II explored potential differences between teachers with and without formal subject specific FH education. Results revealed 44% of the teachers were formally qualified, with the number of unqualified teachers being higher at the primary school level. A higher proportion of the formally qualified FH teachers was more content teaching and felt that they mastered their teaching to a more considerable degree than those without formal FH competence. Also, a higher proportion of the formally qualified FH teachers included the basic skill of writing in their teaching and felt that the subject needed renewal to a larger extent. No differences were found relating to the use of other basic skills (being able to express oneself orally, read, do mathematics, and use digital tools), gender, the use of dietary guidelines in teaching, the ability to influence student attitudes towards nutrition and health, the FH teacher being a resource for health promotion among students, or the experience of the subject having relevance for society.

Covering both aims of mapping and developing learning tasks, Paper III explored teaching practices and teacher/student experiences with the subject at the school level through FGDs with both groups. From the thematic analysis performed, three themes were identified. The first theme, "students and teachers value cooking," represents the enjoyment of cooking and the prioritizing of such activities in FH classes. The second theme, "limited time," describes the time scarcity in FH lessons felt among teachers. According to the teachers, this limits what they can achieve as teachers and is thus a big challenge. The third theme, "pedagogical solutions to resolve the mismatch," represents students' and teachers' suggestions regarding the outline and design of the learning tasks to be

developed in this project. Activities were recommended to be practical, student-active, and easily usable and adoptable by teachers.

Regarding the second aim of this thesis, Paper IV presented the findings from testing the developed learning tasks in a classroom setting. Overall, the activities activated the students in various ways and challenged them to collaborate and communicate in accordance with sociocultural learning. However, many students struggled with arguing and discussing. Therefore, as the students' learning outcomes are likely to increase, students should learn and use these study skills more often in school. Although the learning tasks were different, the FH teachers and students enjoyed the tasks' practical design.

Results from this thesis suggest the primary focus in FH lessons in school is on cooking, with less time left for the theoretical aspects of the curriculum, and thus comprehensive FH education (Papers I and III). More than half of the FH teachers lack formal competence, which may affect the teaching that students receive (Paper II). The learning tasks in this project were developed to better integrate the theoretical and practical aspects of the subject. Both students and teachers enjoyed the developed learning tasks, which could contribute to more comprehensive FH education by providing students the opportunity to work actively with the more theoretical aspects of the curriculum (Paper IV).

Overall, these findings draw attention to the importance of further development of the subject alongside the need for educators and policymakers to prioritize and strengthen comprehensive FH education, so it can serve as an important contributor to health promotion among this age group.

List of papers

Paper I

Beinert C., Øverby NC., Åbacka G., Engeset D., Hillesund ER., Ask AMS., & Vik FN. (2020). *The state of learning activities in teaching Home Economics: A cross sectional study in Norwegian schools*. *International Journal of Home Economics*, 13(1), 2–14.

Paper II

Vik FV., Beinert C., Palojoki P., Hillesund ER., Engeset D., Ask AMS., Åbacka G., & Øverby NC. *Differences in formal education among Norwegian Home Economics teachers*. *Journal of the International Society for Teacher Education* (in press).

Paper III

Beinert C., Palojoki P., Åbacka G., Hardy-Johnson P., Engeset D., Hillesund ER., Ask AMS., Øverby NC., & Vik FN. (2020). *The mismatch between teaching practices and curriculum goals in Norwegian Home Economics classes: a missed opportunity*, *Education Inquiry*. DOI: 10.1080/20004508.2020.1816677

Paper IV

Beinert C., Palojoki P., Åbacka G., Øverby NC., & Vik FN. “*Is there any sugar in bread?*”: *A qualitative video analysis of student activating learning tasks in Home Economics*. *Acta Didactica Norden* (under review).

Abbreviations

FH	Food and Health
FAO	Food and Agricultural Organization
FGDs	Focus Groups Discussions
EAA	European Economic Area Agreement
ECTS	European Credit Transfer and Accumulation System
GBDR	Global Burden of Disease Risk
HE	Home Economics
HLS	Health and Life Skills
NCDs	Non-Communicable Diseases
OECD	Organization for Economic Co-operation and Development
PCK	Pedagogical Content Knowledge
SES	Socio-Economic Status
TA	Thematic Analysis
UN	United Nations
WHO	World Health Organization
ZDP	Zone of Proximal Development

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1 Introduction

In this short introduction, my academic background in nutrition and public health is stated, along with a rationale for the work presented in this thesis. These different issues highlighted here will then be further discussed in the background section.

After studying the field of nutrition and later public health sciences, I became fascinated by the complexity of health and health behavior. Then, when a Ph.D. position on the *LifeLab Food and Health* (FH) project was announced, I knew it would be a great challenge and opportunity for me. The project aimed to develop and test different student-active learning tasks for FH, thus providing students with knowledge, skills, and understanding of the subject. Upon my assignment to the position and study of the FH curriculum, I realized the subject's great potential for providing students with important competencies relating to food and health matters, thereby contributing to health promotion among this age group.

In Norway, FH, formerly known as Home Economics (HE), covers education in food, diet, and health in primary and lower secondary schools. FH is a mandatory subject contributing to students' ability to become competent consumers regarding food and its impact on health and the environment. Students shall learn how to compose a nutritionally safe and proper diet in line with health authority recommendations and contribute to a lifestyle with an awareness of what promotes good health. FH can, therefore, serve as an important contributor to health promotion within this age group. Still, despite the subject's importance from a public health perspective, less than half of the teachers teaching FH today are formally qualified FH teachers (Perlic, 2019). By educating students in such important life skills as highlighted in the curriculum, it is crucial this subject is taught by skillful teachers with a proper degree in teacher education. The subject also suffers from a low number of compulsory lesson hours in the Norwegian school system, and, further, developmental work with the subject has been limited over the years. Consequently, since practical work relating to cooking in the school kitchen has historically strong roots, it is still the focus of today's teaching (Bottolfs, 2020; Espeland et al., 2013; Øvrebø, 2014; Veka et al., 2018). This can be at the expense of more comprehensive FH education, focusing on

both the curriculum's theoretical and practical aspects. The question is: how do we utilize the full potential of the subject in today's teaching practice?

Since research on FH in Norway is scarce, this thesis aspires to contribute to the body of knowledge relating to the subject and explore how it can be further developed to provide children and adolescents with essential competencies, which can positively impact their food choices and dietary behavior. The LifeLab FH project aims to create even stronger connections between public health and pedagogics. Therefore, this thesis stands between public health and nutrition on one side and education and pedagogics on the other. Combining a public health perspective and pedagogical perspective can strengthen FH education in creating a strong basis for learning, by shifting focus to the teaching and learning methods used in classrooms.

2 Background

2.1 The public health perspective

2.1.1 Diet and health

What we eat is fundamental to our health. Food provides energy and nutrients to all bodily functions, which uphold our work capacity and well-being, thereby building human capital. A healthy diet is especially important for children and adolescents because it fosters healthy growth and development and reduces the risk of being overweight or obese later in life (European Commission, 2014). The importance of a healthy diet to reduce the risk of non-communicable diseases (NCDs) has been well-established by the Global Burden of Disease Risk (GBDR) study (Afshin et al., 2019). The GBDR study has identified a low intake of whole grains and fruits and a high sodium intake to be the three leading dietary risk factors in many countries (Afshin et al., 2019). Globally, 71% of all deaths were caused by NCDs in 2016, rising from 63% in 2008 (Alwan, 2011). As a result, multisectoral collaboration and cooperation at the national, regional, and global levels have been proposed by the World Health Organization (WHO) to prevent and avoid the burden of NCDs (World Health Organization, 2013). Still, the major health challenges seen today, such as obesity and NCDs, can be prevented. A healthy diet reduces the risk of NCDs, including cardiovascular disease, cancer, type 2 diabetes, and all-cause mortality (Afshin et al., 2019; Aune et al., 2017; Meier et al., 2019). Consequently, an improved diet can potentially prevent one in every five deaths globally (Afshin et al., 2019).

In Norway, the three most dominating risk factors related to disease are high blood pressure, unhealthy diet, and tobacco use, contributing to making NCDs' account for 85-90% of the disease burden (Institute of Public Health, 2016). Norwegian national dietary advice recommends a diet rich in vegetables, fruits, berries, whole-grain products, and fish with only limited amounts of processed meat, red meat, salt, and sugar (Norwegian Directorate of Health, 2014). These recommendations are based on two reports aiming to better the health of the population and prevent NCDs' development (Nordic Council of Ministers, 2014; Norwegian Directorate of Health, 2011).

Although there have been positive changes in diet over the years by, e.g., decreased sugar intake and increased intake of fruit and vegetables, Norwegians' diets are still not in line with health authority recommendations (Norwegian Directorate of Health, 2020). According to the latest dietary survey among adults in Norway, fruit, vegetables, berries, fish, and whole-grain product intake was lower than recommended (Totland et al., 2012). The diet was also too high in saturated fat and low in fiber.

The diet among nine- and thirteen-year-olds in Norway is largely in line with the recommendations (Hansen Brooke et al., 2016). Still, there are some shortcomings. Children and adolescents consume too much saturated fat and added sugar and too little fruit, vegetables, and fish (Hansen Brooke et al., 2016).

Based on the central role food and nutrition have for human capital, health, and social development, the UN General Assembly announced April 1st, 2016, that the decade 2016-2025 will be the “decade of action on nutrition” (World Health Organization, 2018b). Also, a European Food and Nutrition Action Plan 2015-2020 was published to guide member states toward effective policies at the national level (World Health Organization, 2015). The action plan's objective was to “promote the gains of a healthy diet throughout the life-course, especially for the most vulnerable groups” (World Health Organization, 2015, p. 13). In strengthening people's ability to make healthy choices, improving people's food and health literacy, and enhancing food and nutrition skills is key, with schools highlighted as important arenas to do so. Since Norway is committed to an international collaboration with the WHO, the United Nations (UN), and the Food and Agriculture Organization (FAO) to promote healthy diets and proper nutrition, the action plans and guidelines published by these organizations regarding diet shapes Norwegian food politics (Norwegian Ministries, 2017).

Shortly after the UN's announcement, the Norwegian Action Plan for a Healthier Diet, guided by the WHO action plan for the prevention and control of NCDs, was published (Ministry of Health and Care Services, 2017; World Health Organization, 2013). The Norwegian action plan's primary goal is “a healthy and varied diet for the entire population, regardless of gender, age, geographical location, socioeconomic status, cultural background, level of ability, religion and life philosophy” (Ministry of Health and Care Services, 2017, p. 5). In the report,

dietary changes have been given quantitative targets for change by the year 2021, and all sectors' efforts are highlighted as crucial to success. Children and adolescents have been given special priority to the aim that the proportion of 15-year-olds who eat sweets or drink sugar-sweetened beverages five times a week or more is reduced by 50%, and the number of 15-year-olds who eat vegetables and fruit daily increases by the same amount. Furthermore, a desired 30% increase in the proportion of 15-year-olds who eat breakfast daily has been specified alongside a desired 20% increase in eating fish spread at least three times a week and fish for dinner once a week among 15- to 24-year-olds (Ministry of Health and Care Services, 2017). The action plan proposes that all students receive the recommended 20-minute lunch break at school. The report has also suggested mobilizing children as agents for change through positive engagement and enhancement of their practical skills. Of utmost importance for this thesis, the report has highlighted the need to develop tools and resources within the FH subject and increase teacher competency (Ministry of Health and Care Services, 2017). In addition to the action plan, a letter of intent between the food industry and the health authority was signed in 2016 to strengthen their collaboration in making it easier for the consumer to make healthy food choices and hence adhere to a diet closer to the national nutritional recommendations (Ministry of Health and Care Services, 2016). The report acknowledged the importance of a healthy childhood diet and the social inequalities in diet present within the population. Given the centrality of these inequalities in diet and health, this will be discussed in the following section.

2.1.2 Socioeconomic differences in health

Diet and other health-related behaviors are not equally distributed among individuals (Pampel et al., 2010). These differences occur as a result of inequalities in power, resources, and money, which affects the conditions of daily life (Marmot et al., 2010, p. 16). Consequently, people with high incomes, education levels, and occupational status (high socioeconomic status, high SES) live longer and suffer from fewer health problems than those with lower incomes, educational levels, and occupational status (low socioeconomic status, low SES) (Dahl et al., 2014; Strand & Madsen, 2018). These health inequalities follow a gradient; the higher up on the socioeconomic gradient, the better the health (Dahl et al., 2014).

Adults, adolescents, and children with lower SES have poorer diets in that they eat less fruit, vegetables, and fish and consume more sugar-sweetened beverages and fast food (Darmon & Drewnowski, 2008; Fismen et al., 2016; Skårdal et al., 2014; Watts et al., 2016). As an approach to reduce such inequalities in Norway, school initiatives such as providing free fruit, vegetables, and school meals have been proposed with positive results (Bere et al., 2015; Stea et al., 2018; Vik et al., 2019). Serving nutritious, free lunches to all students in Swedish primary and lower secondary schools has also shown to reduce social inequalities in diet between students of parents with higher and lower education levels supporting the effectiveness of such approaches in the school setting (Colombo et al., 2020). At the individual level, a recent systematic review found self-efficacy, preference, and knowledge to be consistent mediators of socioeconomic status and dietary behaviors among youth (Mekonnen et al., 2020). Therefore, focusing on these three mediators may be valuable in impacting dietary behavior at the intrapersonal level among this age group. Also, awareness raising activities can increase adolescents self-confidence in recognizing healthy alternatives and facilitate them in pursuing a healthy lifestyle (Holmberg et al., 2018). In a sample of 1092 adults, Carbonneau et al found significant positive associations between nutrition knowledge and healthy eating and that nutrition knowledge had a more substantial influence on healthy eating among individuals with lower education levels (Carbonneau et al., 2020). Thus, the authors suggest HE classes, in which students learn basic cooking and healthy eating habits, could help reduce the nutrition knowledge gap between people with high and lower levels of education.

Despite efforts through the Public Health Act (Lovdata, 2011) and other political initiatives (Dahl et al., 2014; Ministry of Health and Care Services, 2007), Norway struggles to reduce inequalities in health (Mackenbach et al., 2016). Diderichsen states that there is a need to understand how political principles can be put into concrete action (Diderichsen et al., 2015). Based on the report outlined by Dahl (2014) and other literature, the Council for Social Inequality in Health appointed by the Norwegian Directorate of Health has now sharpened the messages previously outlined by Dahl and presented which efforts should be prioritized onwards (Arntzen et al., 2018, 2019).

Achieving equity in health is at the center of health promotion, described briefly in the next section.

2.1.3 Health promotion

The Ottawa Charter defined health promotion as “the process of enabling people to increase control over, and to improve their health,” (World Health Organization, 1986) and thereby helping people “to be as healthy as they wish to be” (Bunton & MacDonald, 2002, p. 102). Empowerment is, therefore, a central principle of health promotion. Empowerment is a process where people gain mastery of their own life by integrating knowledge and action and promoting co-learning (Wallerstein et al., 2015, p. 284). Rather than pushing people to change, empowerment focuses on removing obstacles to change and promotes informed decision-making (Glanz et al., 2015, p. 30).

Still, changing health-related behavior, e.g., diet, is a complex matter, in need of “careful, thoughtful science that leads to a deep understanding of the nature of what motivates people and the social and economic pressures that act upon them” (Kelly & Barker, 2016, p. 114). Hence, the reports and action plans mentioned above all emphasize the importance of multisectoral approaches to increase their chances of success (Ministry of Health and Care Services, 2017; World Health Organization, 2013, 2015). Ecological models specify multiple levels that influence health behavior, including intrapersonal or individual-, interpersonal-, institutional or organizational-, community-, and public policy factors (Sallis & Owen, 2015). These are often presented as a “rainbow”- model (Figure 1), outlined by Dahlgren and Whitehead in 1991 and play an important role in explaining social inequalities in health (Dahlgren & Whitehead, 2007).

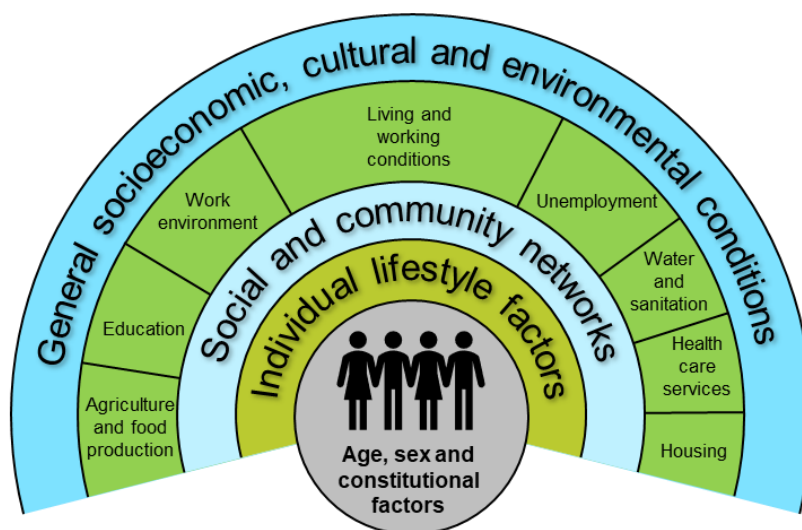


Figure 1. Determinants of Health (Dahlgren & Whitehead, 2007).

Health promotion strategies targeting several levels (ecological models) are more efficient than targeting only one (Dahlgren & Whitehead, 2007; Rutter et al., 2017; Sallis & Owen, 2015). To illustrate, the combination of smoking cessation programs, increased tobacco prices, restricting opportunities to smoke, and mass media campaigns have contributed to the decrease in smoking prevalence in many countries (Sallis & Owen, 2015). Similarly, the food we buy and what we eat is greatly affected by our food environment. The newly published Food EPI report has, therefore, provided recommendations for which initiatives the authorities should prioritize onwards to change our food environment in a healthier direction, covering both physical, economic, political and socio-cultural components (Torheim et al., 2020).

The Ottawa Charter presents five central themes within health promotion: building healthy policy, creating supportive environments, strengthening community action, developing personal skills, and reorienting health services (World Health Organization, 1986). In developing personal skills, health promotion seeks to support personal and social development by providing information, education for health, and enhancement of life skills. This may then increase people's ability to control their health and environments while making healthy choices. Finally, the charter recommends a political commitment to health and equity in all sectors and acknowledges school, work, home, and community settings as arenas facilitating lifelong learning (World Health Organization, 1986). For this thesis, the school setting is of particular relevance and will be discussed further.

2.2 Health promotion in the school setting

2.2.1 Food and nutrition education in schools

As argued, a healthy diet is one of our most essential resources for healthy lives. Although adhering to a healthy diet is important throughout life course (Stephenson et al., 2018; World Health Organization, 2020), investing in child and adolescent health is especially important as it yield benefits for both current and future generations, as early health predicts later-life health (Bundy et al., 2018; Marmot et al., 2010; Patton et al., 2018, 2016). Therefore, a WHO-Lancet

commission recently acknowledged childhood as “a special time for vulnerability, but also of opportunity” (Clark et al., 2020, p. 607).

Due to the considerable number of children and adolescents we can reach through school, promoting healthy behavior in this setting is acknowledged as beneficial, not only for the students themselves but also for their families, peers, and communities (World Health Organization, 2006, 2018a). In 1995, the WHO launched the Global School Health initiative to mobilize and strengthen health promotion and educational activities at multiple levels (World Health Organization, n.d.). Through this initiative, the WHO sought to increase the number of “health-promoting schools,” which strive to strengthen “its capacity as a healthy setting for living, learning and working” (World Health Organization, n.d.). The end goal is health improvement for all members of the community through schools.

Systematic reviews have found evidence for multicomponent interventions in the school setting being effective in improving diet (Meiklejohn et al., 2016; Mozaffarian et al., 2012; Murimi et al., 2018; Van Cauwenberghe et al., 2010; World Health Organization, 2009) and that the more schools do to promote healthy eating among the students, the greater the odds of students making healthier dietary choices (Townsend et al., 2011).

The WHO Regional Office for Europe provides recommendations for best practices on promoting health through education and the practice of good nutrition (World Health Organization, 2006). The report states that a universal food and nutrition policy is not realistic to establish due to the large differences in school systems across Europe (World Health Organization, 2006). However, they recognize four common elements all school systems share: school community, school curriculum, school environment, and school nutrition and health services. Regarding school environment and nutrition and health services, Norway has national guidelines for food and meals in schools which provide recommendations for what to serve, duration of lunch, school-parent collaboration, and subscription schemes on milk, fruit, and vegetables, to mention some (Norwegian Directorate of Health, 2015). Although the school systems’ four elements are equally important, the curriculum element is of special interest for this thesis and will be presented further.

First, the WHO report acknowledges that several countries have attempted to integrate food and nutrition into different subjects. More so, it clearly states the importance of having qualified teachers and adequate resources to teach modern food skills and healthy eating (World Health Organization, 2006, p. 14). Therefore, compulsory nutrition education and cooking classes, provided by specialized teachers, are recommended. Then, recommendations for which topics such HE curriculum should cover are provided, stating that HE as a subject needs enhanced promotion and marketing as a contemporary and future-oriented subject that must cover several broad topics like basic food preparation and cooking skills, consumer awareness and rights, nutrition and personal health, and sustainability (World Health Organization, 2006, p. 14). Life skills specific to nutrition are also recommended, such as critical thinking skills relating to, e.g., marketing and nutritional claims, or decision-making skills to choose nutritious food and snacks. Finally, the report presents guidelines on evaluating food and nutrition education material, which should be done carefully before implementation (World Health Organization, 2006, p. 15).

As seen, there is a political will to further improve education regarding healthy food choices among schoolchildren and adolescents, and work in strengthening school-based food and nutrition education continues today. The EU Action Plan on Childhood Obesity valid between 2014-2020 recommends improving the education regarding healthy food choices by educating children in nutrition and healthy lifestyle, sustainability, awareness-raising activities, and practical cooking (European Commission, 2014). As previously mentioned, through the European Economic Area Agreement (EAA), Norway is committed to complying with EU regulation, including those regarding food. Hence, the EU and the WHO's recommendations must be taken into consideration in Norwegian food policies, resulting in many similarities.

2.2.2 Food and nutrition education through Home Economics education

The International Federation for Home Economics places HE education within the human sciences, drawing from multiple disciplines to achieve optimal and sustainable living for individuals, families, and communities (International Federation for Home Economics, 2008). HE education is delivered through different subjects around the world. However, only a few countries have a

specific, mandatory subject dedicated to food and nutrition education like Norway. Still, our neighbors, Sweden, Finland, and Denmark, have mandatory subjects similar to the Norwegian FH subject (Ministry of Children and Education, 2019; National Agency for Education, 2019; National Board of Education, 2014). These subjects are known as Home and Consumer studies (Sweden), Kotitalous (Home Economics) (Finland), and Food Knowledge (Denmark), but are often referred to as HE education internationally. Therefore, HE is often used as an umbrella term. Still, HE can also be a part of a subject and not a subject itself. This is evident in the Icelandic and the Estonian curriculum, where HE is connected to Crafts education (Ministry of Education Science and Culture, 2014; Taar, 2017).

In this thesis, FH will refer to the Norwegian subject, while HE will be used when referencing HE in an international context.

The European Commission has mapped school food policies across its member states (Storcksdieck genannt Bonsmann et al., 2014). Regarding school curriculums, they found two-thirds having mandatory food and nutrition elements included in their curriculums (Storcksdieck genannt Bonsmann et al., 2014). However, the extent to which this is included and delivered to students by the different countries is not presented in the report. Furthermore, McCloat and Caraher (2020) mapped food education curriculum at the secondary level across seven countries worldwide (Republic of Ireland, Northern Ireland, England, Malta, Japan, and Australia (state of Victoria)). They found HE education being offered both as an optional subject (Republic of Ireland, Australia, and Malta) or as a combination of both optional and mandatory (Japan, Finland, and Northern Ireland). Given the role HE has in educating students in food, nutrition, and cooking skills, the authors conclude that food education should be part of the curriculum and taught by trained HE teachers through a subject such as HE.

Based on the increasing diet-related health challenges seen today, Lichtenstein and Ludwig (2010) have argued in their commentary for how HE education may be the best investment societies can make. They stated that educating students in the scientific and practical aspects of food will provide them with the confidence they need to select, handle, and prepare food.

Research has shown that learning cooking skills at a young age (age ≤ 18) is positively related to cooking, food skills, cooking attitude, and diet quality later in life (Lavelle et al., 2016). Still, if cooking initiatives in schools aim to impact student eating habits, multiple approaches are needed (Seeley et al., 2010).

Burton et al. (2017) have explored whether food-related confidence (nutrition knowledge and cooking capability) affects dietary practices among 1059 Australian adults. The results suggest that individuals with high food-skills confidence were more likely to engage in healthy food practices. Thus, they highlight HE education as a promising path to ensure young individuals gain the necessary knowledge and skills to become confident consumers. Similarly, a positive association between nutrition knowledge and food literacy on dietary intake has been found (Asakura et al., 2017; Grosso et al., 2013). Furthermore, although reporting on limitations like variations in measurement instruments, self-reported data, and cross-sectional designs, by which the latter causes failure to produce causality, systematic reviews support that greater nutrition knowledge and food literacy may be associated with better dietary practices (Bailey et al., 2019; Spronk et al., 2014; Vaitkeviciute et al., 2014; Worsley, 2002). Furthermore, Worsley et al. (2015) found that HE education contributes to long-lasting learning of food knowledge. Still, given the challenge related to causality in these studies, more research is necessary to draw any strong conclusions.

Food and nutrition knowledge was ranked as the most important aspect of healthy eating among Australian adolescents (Ronto et al., 2016). However, knowing how to apply their knowledge was important for them to put their knowledge into practice, indicating that knowledge and skills go hand-in-hand. Also, a positive attitude towards cooking and healthy eating was regarded as very important by most students. Similar findings are reported by Burton et al. (2018), who explored Australian adults' views on what they believed were essential food knowledge and skills. They, too, found aspects relating to both nutrition, health, and practical food skills to be essential. The two most important topics selected by the participants were “the effect on food on peoples' health” and “how to prepare food safely” (Burton et al., 2018, p. 286). Finally, adolescents prefer intervention strategies that focused on promoting healthy eating, over the once that discourage unhealthy eating (Stok et al., 2016).

In sum, in addition to general socioeconomic and environmental issues, there is also a large complexity of knowledge, attitudes, and skills at the individual level affecting dietary behavior, as Figure 1 illustrates. Therefore, there is a need for comprehensive approaches to food and nutrition education, which take these individual-level factors into account (Hollywood et al., 2018; Lavelle et al., 2020; McGowan et al., 2017, 2016; Seeley et al., 2010). The need for comprehensive approaches to education is evident in the recommendations from the WHO (2006) and the European Commission (2014). Both highlight a myriad of topics to be included in the curriculum, like nutrition and healthy lifestyle, cooking, awareness raising activities and sustainability.

The terms nutrition literacy and food literacy, as mentioned previously, are often discussed concerning HE education and its aim or outcome (Ball et al., 2016; Benn, 2014; Pendergast & Dewhurst, 2012; Pendergast et al., 2011; Smith, 2009). However, through a systematic review exploring the definitions of the two concepts, Krause et al. (2016) found six definitions of nutrition literacy and thirteen definitions of food literacy in the literature, the latter being more comprehensive by including both theoretical and practical knowledge and skills. Due to the many definitions in the literature, there seems to be no consensus on a clear definition of these concepts, despite the many similarities. However, as the FH curriculum describes the subject's aims and objectives, based on a variety of competencies relating to both food and nutrition, this thesis's focus will be on the students acquiring the competencies outlined in the curriculum, and not literacy per se. A description of the FH subject is provided in the next section.

2.2.3 Home Economics education in Norway - Food and Health

For more than a hundred years, children and adolescents in Norway have been educated in food, nutrition, and health matters through HE education, putting Norway ahead of many other European countries in this regard.

In 2006, the subject was renewed, and the name was changed from Home Knowledge (*Heimkunnskap* in Norwegian) (Norwegian Ministry of Education Research and Church Affairs, 1996) to FH (Directorate for Education and Training, 2006).

When looking into former textbooks and previous FH curriculum, we see that in addition to focusing on food, nutrition, and health, early FH education focused more on obligations like how to take care of your family and home, on cleaning, and proper table manners (Askeland et al., 2017; Norwegian Ministry of Education Research and Church Affairs, 1996). Much of this has been taken out of the current FH curriculum, which has a narrower and stronger focus on educating students in food and its connection to health, as the name also indicates. FH covers education relating to food, nutrition, and health in primary and lower secondary schools and is highlighted as an important subject in providing students with practical life skills (Norwegian Ministries, 2007, p. 87).

FH is one of four practical and aesthetic subjects in Norway (Ministry of Education and Research, 2019). Hence, practical and creative work stands as the cornerstone of the FH subject through working with the trial-and-error approach, creativity, and skills (Directorate for Education and Training, 2006).

The FH curriculum states that knowledge of food and meals may reduce differences in health, thereby implying that the subject can reduce social inequalities (Directorate for Education and Training, 2006). Briefly, the objectives of FH are threefold: first, “as a general study subject, FH shall contribute to giving pupils an insight into and the ability to choose and reflect critically on food and meals”; second; “as a creative subject, food and health shall allow experimentation and development of critical judgment in connection with food and meals”; and finally, “as a practical subject, the teaching in food and health shall stimulate pupils to prepare food and experience the joy of working, to acquire good working habits and to become critical consumers so they can take responsibility for food and meals at home, in recreation situations and in working life and social life” (Directorate for Education and Training, 2006, p. 1). Thus, FH is characterized as a subject aiming to contribute to diet related health promotion among children and adolescents, by providing comprehensive food and nutrition education to all students in primary and lower secondary school.

There are three main subject areas in FH: food and lifestyle, food and consumption, and food and culture (Directorate for Education and Training, 2006). Put briefly, “food and lifestyle” involves developing skills and motivation

in choosing a health-promoting lifestyle and the ability to reflect upon the relationship between lifestyle, food, and health. “Food and consumption” focus on getting to know different foodstuffs, food labeling, food production, and being a critical and responsible consumer. Finally, within “food and culture,” knowledge about food costumes relating to everyday life, festive seasons, Norwegian food traditions, and food in different cultures and religions is central. The first two subject areas indicate that the FH subject aims to promote the students’ health through empowerment. Furthermore, the three subject areas hold several competence aims, provided after 4th grade, 7th grade, and 10th grade. These competency aims cover both theoretical aspects, formulated as being able to explain, discuss, elaborate, or assess on different food and nutrition topics like, “talk about guidelines for healthy eating from the health authorities, and provide examples of the relation between eating, health and lifestyle” (7th grade), and more practical aspects, like prepare, create, or develop, like “prepare food for different social contexts and discuss how food helps create identity” (10th grade) (Directorate for Education and Training, 2006). Finally, as for all subjects, there are five basic skills integrated into the competency aims: being able to express oneself orally and in writing, being able to read, being able to do mathematics, and being able to use digital tools.

All school subjects in Norway are currently being renewed and the new curricula will be gradually implemented by 2023 (Directorate for Education and Training, 2020a). Regarding FH, the name of the subject remains the same. Like the 2006 curriculum, the new curriculum highlights that the subject is central in developing students’ understanding of the connection between diet and health (Directorate for Education and Training, 2019b). It also states that the subject will contribute to promote public health, thus placing health promotion on the curriculum. Students shall further develop competence to master their own lives. Building students’ competence relating to food, nutrition, and health is hence still central. The students will be able to select foods that are both health-promoting and sustainable, learn to plan and cook, and experience a meal with peers. The subject will, through practical work, experimentation, and aesthetical forms of expression, contribute to students developing engagement, creative abilities, and the ability to create (Directorate for Education and Training, 2019b). There are three core elements in the curriculum, which resemble the current subject areas: “health-promoting diets”, “sustainable eating habits and sustainable

consumption”, and “food and meals as an expression of identity and culture”. However, as this curriculum was not published at the beginning of this project, and the 2006 curriculum was considered throughout the project, the renewed curriculum will not be described further.

The FH subject provides an ideal opportunity to offer high quality and comprehensive food and nutrition education to all children and adolescents, aligning with the recommendations provided by the European Commission (2014) and the WHO (2006, 2015). All recommendations propose educating students in nutrition and health, sustainability, and awareness-raising activities. As multicomponent school-based interventions have been shown to be the most effective in changing dietary behavior (Meiklejohn et al., 2016; Mozaffarian et al., 2012; Murimi et al., 2018; Van Cauwenberghe et al., 2010), comprehensive FH education taught by qualified teachers, supported by schools adhering to the national guidelines for food and meals in schools (Norwegian Directorate of Health, 2015), will strengthen schools as important arenas for health promotion. In contrast to short-term behavioral change interventions, the FH subject offers long-term education, thereby providing a much stronger basis for learning.

As the WHO, the European Commission, and the FH curriculum clearly emphasize the importance of learning both theory and practice, and given the myriad of competencies people need in order to adhere to a healthy diet, what pedagogical principles might be guiding in the development of teaching and learning practices in FH targeting these issues?

2.3 The pedagogical perspective

2.3.1 Teaching and learning in the educational setting

Pedagogy can be defined as the methods and theory of teaching (Cambridge English Dictionary, n.d.). In modern pedagogics, there has been a shift from teaching to learning (Barr & Tagg, 1995). Earlier, the aim of education was teaching or instruction to transfer knowledge to students. Today, learning is the main focus where the purpose is to elicit students’ construction of knowledge (Barr & Tagg, 1995). By placing learning at the center, we can improve the

quality of learning and create powerful learning environments (Barr & Tagg, 1995).

Although there are several theories of learning, learning itself is a complex matter with various definitions (Illeris, 2009). However, there are two definitions describing the learning process and the outcomes of learning which are relevant to this present study. These directions, namely surface-level learning and deep-level learning, were initially discussed in the 1970s, then called deep-level processing and surface-level processing, directed at what aspects of the learning material students focus on (Marton & Säljö, 1976). For example, when a student reads a text, the authors describe surface-level processing as when students only reproduce what is learned, focusing on rote learning. Surface-level learning contrasts with deep-level learning in that it is about learning facts without placing what is learned in context (Ministry of Education and Research, 2016, p. 33). Conversely, during deep-level processing, the students focus on intentional content by understanding what the author of the text wants to say (Marton & Säljö, 1976). Through deep-level learning, the active student is in the center of the learning process. They develop sound and continuous understanding and the ability to use what they have learned in new situations (Ministry of Education and Research, 2016, p. 33). This approach is adapted in the Norwegian school policy, which gives guidelines on how to organize teaching and learning processes in Norwegian school subjects, including FH.

Students must be active and participate in their learning (Ministry of Education and Research, 2016, p. 39). Active learning tasks (Gogus, 2012) are considered effective in enhancing student learning (Baepler et al., 2014; Nordenbo et al., 2008), although there are differences in the literature as to how active learning is defined (Drew & Mackie, 2011). However, there is a commonality that the responsibility for learning lies with the student (Drew & Mackie, 2011). Bonwell and Eison (1991, p. 2) define active learning techniques as anything that “involves students in doing things and thinking about what they are doing” and considers this to significantly influence student learning. Examples of such activities are questioning, discussions, problem-solving, and peer teaching.

However, both students and teachers must play an active role. Students’ learning increases when teachers have clear goals and rules, serve as visible leaders,

support, motivate, activate the students, and consider the students' different prerequisites (Ministry of Education and Research, 2016). Teachers play an important role in designing classroom activities and how they assess, monitor, and scaffold students when they are working with the activities (Nuthall, 2012). Repstad and Tallaksen (2011) characterize a good teacher as someone using various teaching methods and have several ways of facilitating a stimulating learning environment. Hattie (2013) highlights the importance of teachers who focus on children's cognitive engagement, provide feedback, develop new ways of thinking and reasoning, and emphasize problem-solving and teaching strategies related to the content the students are learning.

The European Commission (2013, pp. 45–46) presents different aspects of teacher competence. These are knowledge, understanding, skills, and personal characteristics like beliefs, attitudes, values, and commitment. According to Hargreaves and Fullan (2012), effective teaching results from teachers' professional capital. Professional capital consists of three kinds of capital: human capital, social capital, and decisional capital. Thus, defining teacher competence and effectiveness is not a simple, straightforward process.

Teacher competence (e.g., being a visible leader, showing enthusiasm, self-efficacy) has positively impacted student achievement (Fauth et al., 2019; Kunter et al., 2013; Nordenbo et al., 2008). The importance of teachers' subject-specific expertise on student achievement has also been stated (Blank & de las Alas, 2009; Darling-Hammond & Youngs, 2002; Metzler & Woessmann, 2012). A term often emerging in the literature is teachers' "pedagogical content knowledge" (PCK) (Fauth et al., 2019; Förtsch et al., 2016; Kunter et al., 2013). Shulman (1987, p. 8) defined this as the blending of content knowledge and pedagogical knowledge to understand how a particular subject matter is organized, presented for instruction, and adapted by learners. Since six out of ten teachers in FH lack formal FH competence (Perlic, 2019), it is now a political effort to increase teacher competence in FH at the national level (Ministry of Education and Research, 2014, 2015a, 2019). Also, to strengthen the public work relating to nutrition, the Food-EPI report also suggests requiring formal competence among FH teachers (Torheim et al., 2020). This demonstrates an acknowledgment of both the importance of formally qualified teachers in FH but also the subject's influence itself.

Four areas of competence guided the priorities in renewing the subjects in Norway. These are subject-specific competence as well as competence in learning, communicating, interacting, participating, exploring, and creating (Ministry of Education and Research, 2015b). For students to acquire these competencies, in-depth learning is required (Ministry of Education and Research, 2015b, p. 10). Within the new core curriculum, competence is defined as “the ability to acquire and apply knowledge and skills to master challenges and solve tasks in familiar and unfamiliar contexts and situations. Competence includes understanding and the ability to reflect and think critically” (Directorate for Education and Training, 2019a, p. 11).

In the new core curriculum, “health and life skills” (HLS) is one of three interdisciplinary topics to be included in all subjects (Directorate for Education and Training, 2019a). HLS “shall give the pupils competence, which promotes sound physical and mental health, and provides opportunities for making responsible life choices,” giving health education a cross-curricular priority (Directorate for Education and Training, 2019a, p. 14). With the other two topics, “democracy and citizenship” and “sustainable development,” HLS is based on current societal challenges requiring attention. HLS and sustainable development are highlighted in the new FH curriculum (Directorate for Education and Training, 2019b). Through HLS in FH, the students will gain knowledge about food and food habits that provide the basis for good health. The topic “sustainable development” in FH emphasizes that both food production and food consumption should be performed in ways that are not harmful, nationally or globally, both today and in the future (Directorate for Education and Training, 2019b).

The principle of metacognition, the reflection on how we learn, what we have learned, and why we learn, is described by the Ministry of Education and Research (2015) as important for students when solving complex problems or completing different tasks. Self-regulated learning and metacognition are essential for learning in all subjects, and in everyday life, pupils will exert this together with others in a social environment (Ministry of Education and Research, 2015b). Thus, social learning cannot be detached from learning subject matter (Directorate for Education and Training, 2019a). Therefore, students

dialogue, communication and collaboration and the ability to listen to others and argue for one's own views is essential to learning. This aligns with sociocultural learning, which will be described in the next section.

2.3.2 Sociocultural learning

Findings from the project “Innovative Learning Environments” conducted by the Organization for Economic Co-operation and Development (OECD) resulted in a book covering research findings related to learning and application (Dumont et al., 2010). A summary of key findings was then published for those wanting to improve their learning environments. The summary defines modern pedagogy as manifested in socio-constructivism, as “learning is understood to be importantly shaped by the context in which it is situated and is actively constructed through social negotiation with others” (Dumont et al., 2012, p. 3). The summary also presents seven principles of learning to guide the development of 21st-century learning environments: learners at the center, the social nature of learning, emotions being integral to learning, recognizing individual differences, stretching all students, assessment for learning, and building horizontal connections (Dumont et al., 2012).

The emphasis on context and social interaction in learning described by Dumont et al. (2012) shares ideas with sociocultural learning (SCL), which is rooted in the work of Lev Vygotsky. Within SCL, social and individual processes are interconnected (John-Steiner & Mahn, 1996; Rogoff, 2008; Säljö, 2001) and, according to Vygotsky, so is our learning and development (Vygotsky, 1978, p. 84). Vygotsky distinguishes between actual mental development level, as the already established developmental stage of a child, and the zone of proximal development (ZPD), as “the distance between actual developmental level as determined by independent problem-solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, p. 86). Central to SCL is the use of tools, e.g., both verbal and physical resources that we access and use in living and understanding our surroundings (Säljö, 2001, p. 21). Language is viewed as an important educational tool when solving difficult tasks, especially as children grow older (Vygotsky, 1978, p. 27). This is also evident in collective thinking, or “interthinking,” where language is an important tool for problem-solving between individuals (Littleton & Mercer, 2013; Mercer, 2013; Säljö,

2001). When students collaboratively discuss and use argumentation to come to agreements, e.g., problem-solving, is what Mercer (2002) calls exploratory talk.

Exploratory talk is defined as when:

... partners engage critically but constructively with each other's ideas. Relevant information is offered for joint consideration. Proposals may be challenged and counter-challenged, but if so reasons are given and alternatives are offered. Agreement is sought as a basis for joint progress. Knowledge is made publicly accountable and reasoning is visible in the talk. (Mercer, 2002, p. 153)

Research shows that this kind of talk rarely happens naturally in classrooms; thus, teachers need to remind and help students accomplish this skill (Gillies, 2003; Maloney & Simon, 2006). This has also been found in HE classrooms, as shown by Taar (2017) and Lindbom et al. (2016). However, when students engage in such social interactions supported by teacher engagement, this can be a powerful tool for learning (Gillies, 2019), which can be defined as “teacher-led, but student-owned” (Resnick & Schantz, 2015, p. 344).

2.4 Current challenges in Food and Health education in Norway

Although research regarding FH in Norway is scarce and often based on small datasets and qualitative research studies, some important challenges are highlighted, mainly related to teaching practices and teacher competence. These challenges may have implications for whether the students reach the competency aims outlined in the curriculum, and thus how strong a role the subject can have in the promotion of the health of students and reduction of social inequalities in health.

Despite its ambitious curriculum, FH is the smallest mandatory subject, with only 197 teaching hours allocated throughout primary and lower secondary school (Directorate for Education and Training, 2018). This constitutes 2.5% of the teaching hours. Also, the amount of FH teachers with formal competence in FH has been and is unfortunately still low compared to other subjects (Lagerstrøm, 2007; Lagerstrøm et al., 2014; Perlic, 2019). At the primary school level, there is no requirement for having ECTS in FH to teach the subject (Directorate for

education and training, 2015). Further, at lower secondary school, only 30 ECTS are required, but only for teachers hired after January 1st, 2014, in a permanent position. Consequently, FH has the lowest amount of educated teachers (measured as having ECTS in FH from their teacher training) across the entire primary and lower secondary school system (Perlic, 2019). Except for the school subject survey consisting of 67 FH teachers conducted in 2011 (Espeland et al., 2013) and a survey of 213 FH teachers in three counties in Norway in 2012 (Bottolfs, 2020), no nationwide survey has explored how the low degree of formally educated FH teachers might affect teaching practice or experiences among FH teachers in Norway. Hence, there is a need for more research exploring this issue.

Furthermore, research indicates that many FH teachers rely more on their perceptions and experiences and less on the curriculum's aim in their teaching (Veka et al., 2018). Similarly, compared to the educated FH teachers, Bottolfs (2020) found that teachers not having a formal qualification in FH teaching to a lower degree adhere to the competency aims in their teaching. Also, what FH teachers perceive as the purpose of the subject has been found to vary considerably, creating differences in what the students learn during FH (Holthe et al., 2013). There also seems to be a stronger focus on developing students practical cooking skills in FH lessons than on learning the more theoretical concepts of the curriculum, such as sustainability, nutrition, diet, and health (Bottolfs, 2020; Espeland et al., 2013; Øvrebø, 2014; Veka et al., 2018). Although cooking skills is an important competence, this is only one of many important competencies highlighted in the curriculum. In total, 70% of the FH teachers studied by Bottolfs (2020) stated that they allocate most time for practical work, placing little emphasis on the theory. Accordingly, FH teachers believed to a larger degree to contribute to students acquiring practical cooking skills than on developing students' knowledge of healthy food (Bottolfs, 2020). Therefore, this focus on cooking may explain why students' knowledge regarding fruit and vegetables has shown not to be adequately developed after a year of FH lessons (Øvrebø, 2014). Despite differences in curriculum, similar tendencies relating to the strong focus on cooking have also been problematized in HE research in England (Owen-Jackson & Rutland, 2016; Rutland & Owen-Jackson, 2015). Given the FH curriculum being comprehensive, by including a myriad of competencies linked to both theoretical and practical aspects, there is a

need to explore why the emphasis on the theory is so low and how we can further develop and strengthen comprehensive FH education in Norway. There is also a need to gain an understanding of how students experience the subject as this can provide valuable insight into how this subject is perceived and implemented (Holthe & Veka, 2019).

Finally, both Norwegian and Swedish HE research has also found teacher-led approaches in HE, were following recipes with little emphasis on creativity stands strong (Espeland et al., 2013; Höijer et al., 2011; Veka et al., 2018). Holthe and Wilhelmsen (2009) state that one challenge with such traditional teacher-led approaches in FH classes is that it does not support creating and experimenting or the development of critical thinking. Still, there is a lack of knowledge concerning to what degree and why FH teachers include different activities relevant to FH, like exploratory or experimental activities, in their teaching. Another challenge highlighted by Holthe and Wilhelmsen (2009) is teaching the students how to make conscious choices and motivate them to choose a health-promoting lifestyle. Höijer (2013) found teacher-led HE classes in Sweden were perceived as detached from reality by students due to a lack of their involvement regarding food choice and purchase. Therefore, what the students do in HE should be similar to what they do at home, so HE is not perceived as disconnected from everyday life (Palojoki, 2003).

2.5 Connecting the public health perspective and the pedagogical perspective

Considering the challenges seen in Norwegian FH education, students may not receive the comprehensive FH education as outlined in the curriculum. Therefore, the subjects' role in increasing students' competence relating to food and health might be inadequate, and, consequently, the subject's role in health promotion.

The recommendations provided by the WHO (World Health Organization, 2006, 2015) and European Commission (2014) only include what topics to include in food and nutrition education, but not how these topics should be taught in the classroom setting. The same applies to the FH curriculum (Directorate for Education and Training, 2006, 2019b). However, the new core curriculum states

that there must be room for in-depth learning and that students' learning and development must be the focus of school activities (Directorate for Education and Training, 2019a). Furthermore, the recommendations published by the OECD (Dumont et al., 2012) regarding learning in the 21st century also clearly acknowledge the importance of placing students at the center and the importance of social interaction to facilitate students learning. This is in accordance with SCL (John-Steiner & Mahn, 1996; Rogoff, 2008) and the work by Vygotsky (1978), Mercer (2002, 2013), and Säljö (2001). Therefore, these should be guiding principles when working with teaching and learning practices in the school setting.

In Estonian HE classes, Taar (2017) suggests focusing more on cognitive-oriented learning tasks and developing students' exploratory talk skills. She encourages HE teachers to find ways to include theoretical aspects of the curriculum into their teaching and suggests developing tasks that enable students to engage in the theoretical aspects of the subject in a meaningful and engaging way.

Following an SCL approach would be valuable in helping students acquire the competencies highlighted in the FH curriculum and strengthening FH education's ability to impact students' dietary behavior. Given the multiple factors impacting our dietary behavior, all aspects of the FH curriculum must be given equal attention. This way, the subject can serve as an even stronger influential channel for health promotion among children and adolescents.

3 Aims

The aims of this thesis were twofold: first, to map teaching practices in FH in Norway, at the national and school levels, with special emphasis on learning activities, teacher competence, and experiences among FH teachers and students in Norway; second, to develop and test different student-activating learning tasks aiming to strengthen comprehensive FH education.

These two aims sum up the specific aims of the four papers included in this thesis, where Paper I and II respond to the first aim, Paper III includes both the first and the second aim, and Paper IV responds to the second aim. The four papers specifically aimed to:

1. Examine the use of exploratory/experimental activities, flipped classroom, activities where students are encouraged to use their senses and digital tools in FH. Also, to explore which factors teachers report as barriers and promoters to teaching and learning among students in this subject (Paper I).
2. Explore potential differences between teachers with formal versus no formal subject-specific FH education regarding school level, gender, age, length of experience in teaching, contentment and feeling of mastering teaching FH, and whether they include basic skills, and seeing potential needs for a renewal of FH in Norway (Paper II).
3. Explore teachers' and students' perspectives and experiences of current classroom practices in FH and to use these experiences and insights in the development of the student-activating learning tasks (Paper III).
4. Explore how three of the student-activating learning tasks developed in this project can contribute to active learning among students during a FH lesson, by taking a sociocultural approach to learning, and building on skills important in social learning and development (Paper IV).

4 Methods

This chapter describes the LifeLab FH project's overall outline, which can be divided into three sections (Figure 2).

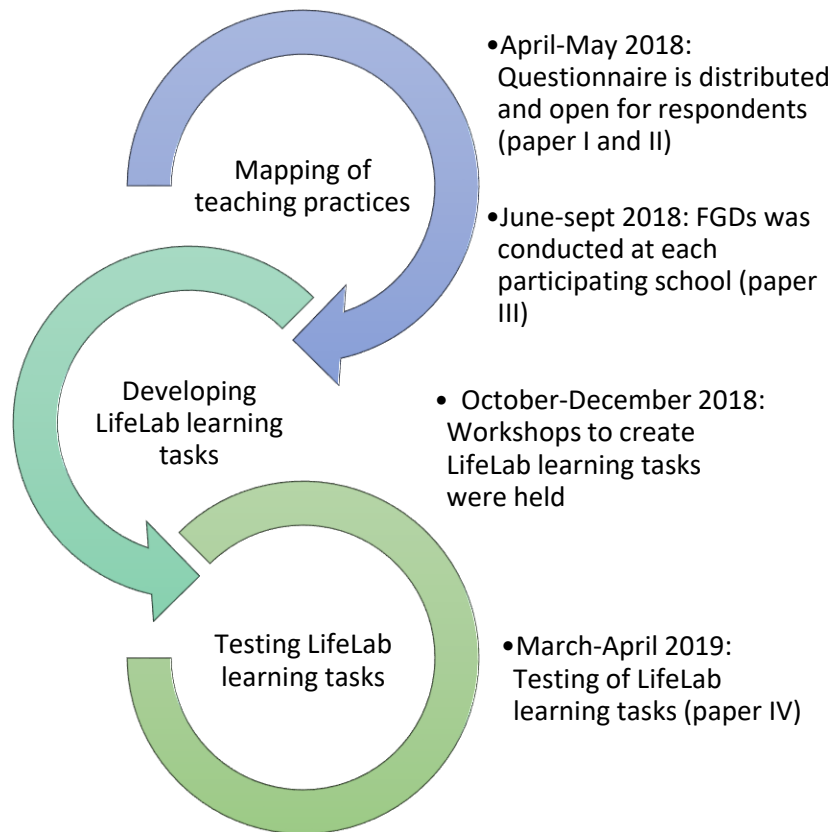


Figure 2. Outline of the LifeLab FH project.

The first section was the mapping of teaching practices in FH (Paper I-III) by developing and distributing a questionnaire to all FH teachers in Norway and conducting focus group discussions (FGDs) with teachers and students at a selection of schools recruited and included in the project. The next section was developing student-active learning tasks targeting more theoretical aspects of the FH curriculum as part of a more comprehensive approach to FH education. The third and final section tested the developed learning tasks (Paper IV) using video recording and observation. For additional details, refer to the four appended research papers.

Research permission for the LifeLab project was obtained from the Norwegian Centre for Research Data (ref.59097) (Appendix I) and the Ethics Committee of the Faculty of Health and Sport Sciences at the University of Agder.

4.1 Mapping of the FH subject

4.1.1 Questionnaire

Development

Concerning the first aim of this thesis, the mapping of FH teaching at the national level, an anonymous online questionnaire (Appendix II) directed at all FH teachers in Norway was developed at the beginning of the project in close collaboration with colleagues working with FH teacher education at the University of Agder, as participants in the LifeLab reference group. Some also had previous work experience as FH teachers. This provided us with valuable competence, increasing our chances of developing a relevant questionnaire that answers the project's research aims. Also, permission to include some of the questions used in the survey by Bottolfs (2020) was obtained.

Finally, the questionnaire contained 25 questions covering several topics, such as the teachers' formal background, aspects related to teaching FH, FH as a health-promoting subject, and the use of different learning activities. The teachers consented to the study by answering the questionnaire, which took approximately 10-15 minutes to complete.

Recruitment

In February 2018, we briefly introduced the LifeLab FH project and the questionnaire in the journal published by The Norwegian Association for teachers in FH (in Norwegian, *Mat og helse i skolen*) to briefly inform the readers about the project and that this questionnaire was directed at all teachers in FH in Norway. Finally, in April 2018, a brief introductory email that contained a link to the project's home page (www.uia.no/lifelab) was outlined and distributed electronically to all primary and lower secondary schools in Norway (n = 2821) registered in the primary school information system (*GSI* in Norwegian). The home page contained all the necessary information about the study and the link to the questionnaire. The email recipient, usually the head teacher (some addresses

in GSI were to the school administration, not the head teacher), was asked to redistribute the email to their teachers in FH. Errors in the registered email addresses were corrected and distributed again to reach as many schools as possible. After two reminders, the questionnaire was closed for participation on May 23rd, 2018, five weeks after the initial email distribution. By then, 1170 FH teachers had completed the questionnaire. In addition to sending emails to all schools, we posted a link to the home page at two Facebook pages relevant to FH teachers (in Norwegian, *Mat og helse-lærerne – vi deler undervisningstips* and *Landslaget for mat og helse i skolen*) hoping to reach additional participants.

Methods for Paper I and II

Both Paper I and II are based on data from the questionnaire. A description of the methods of the two papers is therefore included here. However, as most response categories were merged into fewer categories to be analyzed, please refer to the papers' methods section attached for details. Only the variables included in the analysis are presented here.

As part of mapping teaching practices in FH, with special emphasis on learning activities, Paper I included several questions relating to the use of different learning activities, barriers and promoters for learning and teaching in FH, and formal background information about the teachers. This constitutes 12 of the questions from the questionnaire.

To explore FH's use of different learning activities, we included questions regarding flipped classroom, digital tools, exploratory/experimental activities, and activities where students are encouraged to use their senses. The first question was, "Which of the following learning activities do you use in your FH teaching? You can select multiple response options," where the teachers could select among the four activities listed. The second question was, "On average, how often do you use the following learning activities?" and the alternatives were "every FH class," "1-2 times per month," "less than once per month," and "never". In this question, the four activities were again listed, and the teachers connected each alternative to the different activities (matrix question). We then asked "Are there any of these learning activities you would like to use more often? You can select multiple response options." The teachers then selected among the four activities. The last question regarding the use of the learning

activities was, “Why do you use the following learning activities?”. The activities were then presented, and the teachers connected each activity to the different response alternatives (also a matrix question), which were “the children request it,” “to promote learning among children,” “to promote motivation among children,” “to promote creativity among children,” “for variation,” “to promote cooperation among children,” and “other.”

In examining the teachers’ perception of important barriers for good teaching in FH, we proposed nine statements. These were “lack of equipment,” “non-optimal premises,” “economic factors,” “few hours for the subject,” “collaboration with leaders,” “timetable issues,” “lack of formally qualified teachers,” “the status of the subject” and “problematic working relations with colleagues.” Regarding important promoters of learning in FH, the statements were “engaged teachers,” “good premises for teaching,” “a lot of practical cooking,” “motivated children,” “combination of practical and theoretical teaching,” “varied teaching methods,” “good economy,” “formally qualified teachers” and “a lot of theoretical teaching.” For both questions, the teachers judged them by a five-point Likert scale, where the statements “important” and “very important” were merged in the analysis and presented in the paper.

The different statements were selected in collaboration with colleagues who had experience in teaching FH as they had the relevant background in verifying that the alternatives were relevant.

Regarding teacher characteristics, the age categories used in the analysis were 18-30, 31-40, 41-50, 51-60, and > 60. Years working as an FH teacher were analyzed as ≤ 5 years, 6-10 years, and ≥ 11 years. The questions regarding educational background consisted initially of 11 different alternatives in the questionnaire. These were then merged into the five categories: “teacher education with FH competence,” “teacher education without FH competence,” “FH competence without teacher education,” “chef or restaurant and food processing,” and “unskilled/assistant/other.” Responses in the “other” category were manually moved into the other categories if appropriate (details can be obtained on request).

For Paper II, we examined potential differences between teachers with and without subject-specific FH education regarding several aspects relating to their experiences with the subject and their teaching.

As in Paper I, the question “what is your age?” was merged and analyzed in the categories 18-30, 31-40, 41-50, 51-60, and > 60.

Regarding years of experience working as an FH teacher, we asked, “How many years have you worked as an FH teacher (including Home Economics)?” and merged the responses into 0-5 years, 6-15 years, and ≥ 15 years before analysis.

To explore the potential differences between the teachers with and without FH education, we divided the 11 original alternatives into two categories: teacher education with FH competence (EDU group) and teachers without FH education (no-EDU group). The EDU group consists of the same variables as the variable “teacher education with FH competence” in Paper I (all who are teacher-educated with ECTS in FH from teacher education) while the rest were the no-EDU group. See Paper II for details.

To identify which school level the teachers taught FH at, we asked, “at which level do you teach FH?” where they could select one or more grades from 1 to 10. Then, to separate teachers' responses in primary school and teachers in lower secondary school, we divided and merged them into two categories, grades 1-7 and grades 8-10.

To explore contentment in teaching FH, we asked: “How content do you feel with teaching FH?” The response alternatives were a five-point Likert scale, which was analyzed as “very content/content,” “neither content nor not content,” and “little content/very little content.”

The questions “To what extent do you feel that you master teaching in FH?”, “To what extent do you include the five basic skills (oral, writing, reading, mathematics, use of digital skills) in your FH teaching?” (where the teachers could select them independently), and “To what extent do you follow the dietary guidelines when deciding what food to make in FH class?” were all determined

by a five-point Likert scale, merged into “very large/large extent” and “to some extent/little/very little,” and analyzed accordingly.

We also asked, “To what extent do you feel that food and health is viewed as relevant for the society?”, “To what extent do you feel that teaching FH fosters positive attitudes towards diet and health?”, and “To what extent do you regard FH teachers as a resource in prevention and health promotion among students?” These answers were also on a five-point Likert scale, merged into three categories: “very large/large extent,” “don’t know,” and “to a little extent/not at all” before analysis.

Finally, we asked, “Do you feel a need for a renewal of FH?” with the response options “no, it works fine as it is” and “yes, it’s time for a renewal.”

In both Paper I and II, questionnaire results are presented in frequency and contingency tables, along with p-values where group responses are compared. A chi-squared hypothesis test was used to test for difference between groups, and $p \leq 0.05$ was considered statistically significant. IBM SPSS statistics were used to analyze the data.

4.1.2 Focus group discussions

To achieve our aim of mapping teaching practices and exploring teachers/student perspectives and experiences with the subject at the school level, we invited both groups to participate in FGDs. These FGDs also provided us with guidance regarding the development of the student-active learning task. Their firsthand experience with the subject was therefore regarded as valuable. Data from these FGDs are analyzed in Paper III. Therefore, this paper covers both the first and the second aim of this thesis (mapping and development). Including these stakeholders was important for this project, in accordance with “co-creation of knowledge,” which has been UiA’s vision since 2016 (University of Agder, 2016).

Recruitment

Three schools in Southern Norway, which collaborated with the FH teacher education at UiA were invited to participate in the project. Schools were, therefore, conveniently sampled (Battaglia, 2013). School 1 and 2 were

combined primary and lower secondary schools (schools consisting of both primary school (grades 1-7) and lower secondary school (grades 8-10) while school 3 was a primary school only. School 1 and 2 were larger schools (approx. 400 students at school 1 and 500 students at school 2) while school 3 was smaller (<100 students). The head teacher of each school was contacted by email in May 2018. The email contained a brief information sheet and a request for a meeting to be arranged with the Ph.D. student and supervisors where the schools would get additional information about the study. All head teachers responded positively to the email, and all three schools agreed to participate after the meeting.

Development and testing of topic guide

A semi-structured topic guide (Merriam, 2009, p. 102) was developed for this project and followed during the FGDs, using prompts and follow-up questions to facilitate natural conversation. The topic guides (Appendix III) were developed to capture both student/teacher experiences with the subject and their thoughts on teaching and learning approaches in general. They were also designed to capture student/teacher guidance and suggestions regarding developing the students' active learning tasks.

Before data collection, the Ph.D. student piloted the questions to be used in the FGDs on a group of students in a similar age group (age 10-14) and made necessary adjustments. The questions were also tested on two colleagues at UiA who had previously taught FH themselves.

Focus group discussions

Appointments for participating FGDs were set immediately after the schools agreed to participate in the project. All schools had FH classes in 6th and 9th grade, and the FGDs were held between June and September 2018. Hence, there was a summer holiday (in July) between some of the interviews. Therefore, students interviewed in June were 6th and 9th graders (aged 11 and 14) and students interviewed in September were 7th and 10th graders (aged 12 and 15). In total, 8 FH teachers and 31 students participated in the FGDs.

The focus groups' size depended on how many were available, but was guided by the recommended 5-8 participants (Krueger, 2015). However, at one of the schools, only one FH teacher was available. This individual interview was, therefore, pooled with the others and analyzed together as a whole.

All FGDs were led by the Ph.D. student, recorded with a digital voice recorder, and transcribed verbatim shortly after data collection. Two master's students attended the FGDs at school 2 and 3 as part of their data collection and transcribed the recordings from both schools, while the Ph.D. student transcribed the recordings from school 1.

Information sheets and consent forms (Appendix IV) were distributed to the participants before the FGDs and collected at the time of data collection. Parents consented on behalf of their child, while the students (children) provided assent to participate. The teachers signed a separate consent form.

Analysis of focus groups for Paper III

Thematic analysis (TA) was used to analyze the data, using Braun and Clarke's (2006) step-by-step approach. In the first steps, the researcher familiarized herself with the data by listening to the material and reading the transcripts several times while making initial notes. Throughout this process, codes were created across the dataset. Some of these codes were then merged or discarded. In a reflexive process of reading and coding, similar codes eventually became overarching themes. These themes were then reviewed, defined, and named through discussions with co-authors. NVivo 12 Pro was used for coding and data handling. Please refer to Paper III for further details.

4.2 Development of LifeLab learning tasks

The work regarding the development of the students' active learning tasks started before Paper III was written. Hence, the complete analysis of the FGDs was not final at this stage. However, after reading the transcripts and listening to the recording several times, a rough summary of key findings was written. A simplified thematic map was created to summarize the main findings regarding student/teacher feedback relevant to the development of the learning tasks. These were then considered in the development of the learning tasks.

4.2.1 Pedagogical approach and knowledge base

When this project started, it was established that the entire Norwegian school curriculum would be renewed in 2020. As the new core curriculum and FH curriculum were neither settled nor published during the development of the learning tasks, documents relating to the school renewal (Ministry of Education and Research, 2015b, 2016, 2018) and the current FH curriculum (Directorate for Education and Training, 2006), were considered when developing the learning tasks. We further adopted a sociocultural approach to learning and development (Vygotsky, 1978) described initially.

4.2.2 Workshops

The second approach to co-creation in LifeLab FH was the inclusion of two teacher-students specializing in FH at UiA in the development of the learning tasks. For this, we applied for specific earmarked funding and were granted funding for both. The students were recruited by informing about the study and potential participation during one of their lectures at UiA.

In addition to the two FH teacher-students, the cooperation also included one FH teacher who recently finished her teacher training specializing in FH at UiA, one scientific assistant, and one of the master's students in public health who participated in the FGDs conducted earlier in the project. This master's student was writing her thesis on the LifeLab FH project. In October 2018, a meeting with all six was arranged to get to know each other. Three workshops were held by December 2018, when the group worked to develop learning tasks with the overall theme "food choice." Since "food choice" is a broad concept, involving both knowledge of food and nutrition and the wider notion of what affects food choices, this was regarded as a relevant theme. The learning tasks propose an alternative way of teaching the more theoretical aspects of the subject to strengthen comprehensive FH education.

In between the workshops, the Ph.D. student continued developing the learning tasks and had two meetings with the supervisors, in addition to one separate meeting with the supervisor who holds special competence in FH education. Finally, six learning tasks were developed.

4.2.3 Description of LifeLab learning tasks

The six student-active learning tasks developed in the LifeLab FH project are described in detail here. One video from “NRK video” was shown in class and is therefore described here as a seventh task. The final 50-game was meant primarily as a summary and not to be analyzed. Hence, no competency aims are presented.

Since the learning tasks were pedagogically based on SCL, the students were working in groups of three to four students to facilitate interaction and dialogue. The tasks were chosen based on public health issues relating to the intake of fruit, vegetables, and sugar, and other general competencies relating to food choices like understanding food labeling, food and sustainability, or nutrition claims.

The learning tasks were developed to be used and easily adapted to both 6th and 9th grade, with only minor adjustments in difficulty level. Therefore, we tested the same learning tasks in the 6th and 9th grades. The jigsaw texts were, however, more advanced for 9th grade. Also, some of the line game questions differed between grades and students in 9th grade being expected to measure sugar content without the teacher demonstrating how to do it first.

A presentation of the competence aims from the curriculum and pedagogical approach connected to each learning task is presented below each task description in the following section.

Video

Although it is not a learning task itself, we included a three-minute-long video (see: https://www.nrk.no/video/usunn-mat-til-barn_125190) in the classes. This was an NRK Video obtained from an NRK School (*NRK skole* in Norwegian), which publishes videos appropriate for school-aged children and connects different videos to different subjects, grades, and competency aims.

The video is called “Unhealthy Food for Children” (*usunn mat til barn* in Norwegian) and is categorized by NRK as appropriate for grades 8-10, under the subject area “food and consumption,” and the competency aim “discuss and elaborate on how different marketing methods might influence the choices of

foodstuffs consumers make” (Directorate for Education and Training, 2006, p. 4). A similar competence aim, “discuss product information and advertising for various foods,” is also present in the 6th-grade curriculum (Directorate for Education and Training, 2006, p. 3), and the video was thus regarded as relevant to this grade as well.

The video illustrates and discusses sugar content in different beverages popular among children and adolescents, which we found to be an interesting introduction to the class regarding food choices. After watching the video, the students are encouraged to share their thoughts.

Sugar Task

In this learning task, students were to examine the sugar content of six different and well-known breakfast/lunch items. The items were two types of breakfast cereal (Coco pops and Norwegian whole-meal “Havrefras”), two types of yogurt (Greek yogurt and fruit yogurt), one package of chocolate spread (Norwegian “Nugatti”) and one package of the Norwegian spread “Herkules Prim” (a sweetened spread made of whey from cows’ milk and fortified with iron and vitamin D). The two different cereals and yogurts varied in sugar content to illustrate the differences between similar products.

First, the students are provided with the packaging of the six different breakfast items in addition to sugar cubes and a calculator and then asked to determine the amount of sugar per portion in every item. The nutrition declaration of each item informs about the amount of sugar per 100 grams. Hence, the students must convert sugar per 100 grams to portion size, e.g., sugar per 15 grams. The students are told each cube weighs 2 grams. However, in two of the items, the amount per portion is already declared, so the students only must select the correct amount of sugar cubes. Before the students start the task, the teacher examines the nutrition declaration of the Prim together with the students as an introduction to nutrition declaration and portion sizes and guides them in how to find the correct amount of sugar. After the task, the teacher encourages a discussion and reflection on the findings.

Table 1. Overview of the competence aims and pedagogical approach of the sugar task.

Competence aims, 7 th grade:	Competence aims, 10 th grade:	Pedagogics:
<p><i>Food and lifestyle:</i> “talk about guidelines for healthy eating from the health authorities, and provide examples of the relation between eating, health and lifestyle”</p> <p>“explain the place of the various food groups in our diet”</p> <p><i>Food and consumption:</i> “discuss product information and advertising for various foods”</p>	<p><i>Food and lifestyle:</i> “use digital tools to assess the content of energy and nutrients in food and beverages”</p> <p><i>Food and consumption:</i> “assess and choose foods from a large food market when planning purchases”</p>	<p>Explorative learning/discovery learning</p> <p>Activating students through reflection and raising awareness</p>

Picture-ranking task

In the picture-ranking task, the students are instructed as a group to rank eight pictures of different typical breakfast items from which they believe is the most or least nutritious. If they do not agree within the group on which order to arrange them, they are encouraged to provide explanations and argue for their opinion to come to an agreement.

The eight pictures (Figure 3) are a slice of bread with chocolate spread, a fruit yogurt, a bowl of whole-grain cereal, of a glass of orange juice, natural yogurt with fresh berries, honey, and granola on top, a slice of bread with brown cheese and tomatoes on the side, a glass of chocolate milk and a bowl of chocolate cereal.



Figure 3. Pictures used in the picture-ranking task (pictures: Colourbox).

When the students have arranged all pictures, the teacher holds a class discussion elaborating on the different products, trying to arrange them on the whiteboard in collaboration with the students. The teacher takes one picture at a time and asks the students where they have put it and why they had chosen that position. Through this collaboration, the teacher and the students attempt to find an arrangement. However, since the aim of the task was to educate the students in that there is no simple right or wrong answer, this is highlighted by the teacher and problematized throughout the discussion with the students.

Table 2. Overview of the competence aims and pedagogical approach of the picture-ranking task.

Competence aims, 7th grade:	Competence aims, 10th grade:	Pedagogics:
<p><i>Food and lifestyle:</i> “talk about guidelines for healthy eating from the health authorities, and provide examples of the relation between eating, health, and lifestyle.”</p> <p>“explain the place of the various food groups in our diet”</p> <p><i>Food and culture:</i> “assess what good eating habits involve.”</p>	<p><i>Food and Lifestyle:</i> “...explain the nutrient substances in the food”</p> <p><i>Food and consumption:</i> “assess and choose foods from a large food market when planning purchases”</p>	<p>Collaborative learning (Udvari-Solner, 2012)</p> <p>Problem-based learning (Jonassen & Hung, 2012)</p> <p>Activating students through class discussion, reflection, and argumentation</p>

Jigsaw

We also developed a jigsaw, a learning task in which the students read a text, extract the main message from the text, and retell the main points to their group members. The texts can be found in appendix V.

Each group member has a different text, covering the topics sustainability, social media and health information, food choices or nutrition and health.

Potentially difficult words that need to be discussed with the teacher for clarification are highlighted in italics. The texts are laminated, and the students are handed markers so they can write directly onto the lamination, which can then later be erased.

After the students are finished reading and are familiarized with the text, the students with the same text meet in groups to summarize and discuss what they have read. Then the students return to their original groups and retell the main points to their group members who have not read that text. This way, the students serve as each other’s teachers.

Table 3. Overview of the competence aims and pedagogical approach of the Jigsaw task.

Competence aims, 7 th grade:	Competence aims, 10 th grade:	Pedagogics:
<p><i>Food and lifestyle:</i> “explain the place of the various food groups in our diet”</p> <p>“explain how food functions as a source of energy and bodybuilding substances”</p> <p>“talk about guidelines for healthy eating from the health authorities, and provide examples of the relation between eating, health and lifestyle”</p> <p><i>Food and consumption:</i> “assess, choose and shop with environmental awareness”</p> <p><i>Food and culture:</i> “assess what good eating habits involve.”</p>	<p><i>Food and lifestyle:</i> “inform others about how eating habits might influence diseases that are connected to lifestyle and eating”</p> <p><i>Food and consumption:</i> “discuss and elaborate on how different marketing methods might influence the choices of foodstuffs consumers make”</p> <p>“assess and choose foodstuffs based on ethical and sustainable criteria”</p>	<p>Cooperative learning, learning by teaching (Dumont et al., 2010, p. 169)</p>

5 a day

In the 5 a day learning task, the teacher introduces the task by asking the students if they have heard about the recommendations for fruit and vegetable intake and why it is important to eat it, without revealing the exact recommendations (in grams/portion size, which fruit/vegetables, etc.) from the health authorities. The students are instructed to take the amount they believe make up the 5 a day recommendation from a selection of fruit, vegetable, legumes, and potatoes available at a plate. They are also provided a calculator, pen, and paper. The students are then asked to weigh the amount they have selected and write it down. Then they are asked to peel the banana and orange if they had selected these and weigh it again. Finally, if anyone had selected legumes or potato, they are asked to remove this, along with an explanation that while these items have their place in a diet based on the national dietary recommendations, they are not included in the 5 a day recommendations. Finally, the students weigh their

selection of fruit and vegetables a third time, followed by a collective reflection of the amount left on their plates and comparing it to the recommendations.

Table 4. Overview of the competence aims and pedagogical approach of the five a day task.

Competence aims, 7 th grade:	Competence aims, 10 th grade:	Pedagogics:
<p><i>Food and lifestyle:</i> “talk about guidelines for healthy eating from the health authorities, and provide examples of the relation between eating, health and lifestyle”</p> <p><i>Food and culture:</i> “assess what good eating habits involve”</p>	<p><i>Food and lifestyle:</i> “plan and prepare safe and nutritionally good food, and explain the nutrient substances in the food”</p> <p>“compare meals pupils prepare themselves with eating guidelines from the health authorities”</p> <p><i>Food and consumption:</i> “assess and choose foods from a large food market when planning purchases”</p>	<p>Explorative learning/discovery learning</p> <p>Activating students through reflection and raising awareness</p>

Line game

During the line game, the students are presented with different statements relating to food and health and had to, for example, take a stand on a scale from “agree” to “disagree,” “yes” or “no,” or judge the whole-grain content of two breads based solely on only their look.

First, the teacher places four sheets on the floor, each with one of the icons of the bread scale (*Brødskalaen* in Norwegian). These can be found in appendix V. The teacher then presents two different bread to the students (one at a time) for the students to examine closely and asks them to place themselves at the icon they believe the bread belongs to. One bread is whole-meal but light in color with no visible grains, while the other is darker in color with visible grains but is, in fact, white bread.

The teacher then provides them with the correct answer by showing the students the packaging with the bread scale icon, followed by more information about the recommendations on which to choose and why this can be a helpful tool.

Afterwards, the students are presented with different statements they must consider by placing themselves on a scale from “agree” to “disagree” and “yes” or “no.” Examples of such statements are “It is healthier to eat fresh vegetables

than frozen vegetables?”, “It is dangerous to eat foods that have expired?”, or “My surroundings influence my food choices?”

After each question, follow-up questions are provided for further reflection.

Table 5. Overview of the competence aims and pedagogical approach of the line game task.

Competence aims, 7 th grade:	Competence aims, 10 th grade:	Pedagogics:
<p><i>Food and lifestyle:</i> “talk about guidelines for healthy eating from the health authorities, and provide examples of the relation between eating, health and lifestyle”</p> <p><i>Food and culture:</i> “assess what good eating habits involve”</p> <p>“talk about industrially prepared food and food prepared in large-scale catering”</p> <p><i>Food and consumption:</i> “discuss product information and advertising for various foods”</p> <p>“assess, choose and shop with environmental awareness”</p>	<p><i>Food and lifestyle:</i> “...explain the nutrient substances in the food”</p> <p>“inform others about how eating habits might influence diseases that are connected to lifestyle and eating”</p> <p><i>Food and consumption:</i> “assess and choose foodstuffs based on ethical and sustainable criteria”</p>	<p>Reflection and argumentation (Mercer, 2013)</p>

50-game

To summarize at the end of the class, we developed a quiz called the 50-game. In this activity, 25 cards with questions on both sides constituting 50 questions in total are spread and placed around inside the classroom. Some of the questions are multiple choice, some are related to science and math as part of interdisciplinarity, and some are non-academic, like singing the national anthem in a choir. Please refer to appendix V for the questions used. First, the students who were working together during the class must select a sound that is characteristic of their group only. Then, one person from each group roll dice and must find the card with the number they got. For example, if a student rolls a five, they had to spread around to find card number five quickly. The first student in the group to find it must call for the others using the sound they made initially. The group then finds the solution together and provides the answer to the teachers. If they get the correct answer, they roll the dice again and add this number to the first one, e.g., five plus three, and then they must find card number eight. The first group to reach 50 wins the game.

If there is little time remaining in the class and the task must be finished faster, the students can roll two dice at once instead of only one.

4.3 Testing of LifeLab learning tasks

To test the developed learning tasks as part of this thesis's second aim, we used video recording to collect data. Two of the three schools previously recruited to participate in the LifeLab FH project (school 1 and 3) were again contacted to participate in the testing. The six developed learning tasks were tested at school 3 in March 2019, then at school 1 in April 2019.

One adjustment to the picture-ranking learning tasks was conducted between the testing at school 3 and 1. During the learning task development, it was discussed if the term “healthy” or “nutritious” was going to be used. Since the concept of “healthy” was regarded as most familiar to the students, the students at school 3 were instructed to rank the pictures based on this premise. However, this was changed to most to least “nutritious” at school 1, followed by a discussion of what is meant by “nutritious food” before the students started working on the task. Also, as shown in Table 6, the order of the activities was changed between some of the classes to explore if the video or the sugar task affected the picture-ranking activity in any way.

Since school 3 was a smaller school, the 6th-grade class was small enough (13 students in total) to include all students in one class. School 1, however, was larger. Hence, each 6th-grade class was significantly larger at this school, and the students were split into two groups, with 15 students in each class (see Table 6). Similarly, the 9th-grade class was split into four groups.

In total, 79 students, consisting of four groups of 9th graders and three groups of 6th graders, participated. The learning tasks were held in the order they are listed in Table 6.

Table 6. Overview of the schools, classes, number of students, who was responsible for the teaching* and which learning task was tested at what time.

School 3	Responsible	N students	Learning tasks
6th grade	1, 2	13	Video, sugar task, picture ranking, line game, 50-game
School 1	Responsible	N students	Learning tasks
9th-grade group 1	1, 2, 3	11	Video, sugar task, picture ranking (recess), line game, 50-game
9th-grade group 2	1, 2	9	Video, sugar task, picture ranking (recess), line game, 50-game
9th-grade group 3	1, 3	8	Picture ranking, video, five a day (recess) jigsaw, 50-game
9th-grade group 4	1	8	Picture ranking, video, five a day (recess) jigsaw, 50-game
6th-grade group 1	1, 3	15	Video, sugar task (recess) picture ranking, line game, 50-game
6th-grade group 2	1, 3	15	Picture ranking, video, five a day (recess) jigsaw, 50 game
Total		79	

*1: scientific assistant, 2: master's student, 3: FH teacher student

Three of the participants (called “assistants” onwards) from the workshops described earlier were responsible for leading the class (see Table 6 above) to minimize the FH teachers' burden at the schools. Still, the FH teachers at the two schools had received all information and descriptions of the learning tasks in advance and were invited to participate as much as they liked.

Methods for Paper IV

Paper IV presents the findings from the testing of the learning tasks and will, therefore, be presented here. All the 6th-grade classes and three of the activities were analyzed in this paper. These were the picture-ranking task, the 5 a day task, and the line game, which was decided among the co-authors.

We aimed to explore how the developed learning tasks can contribute to active learning among the students by taking a sociocultural approach to learning. The students were therefore working in groups of three to four students to facilitate social interaction. The FH teachers at the school divided the students into the

groups which they were usually working in during FH lessons, which were both mixed and non-mixed gendered.

We used wide-angled cameras (GoPro Hero and Garmin Virb), which were standing on a small (10 cm approx.) tripod by each group of students to capture verbal and non-verbal communication throughout the class (Figure 3).

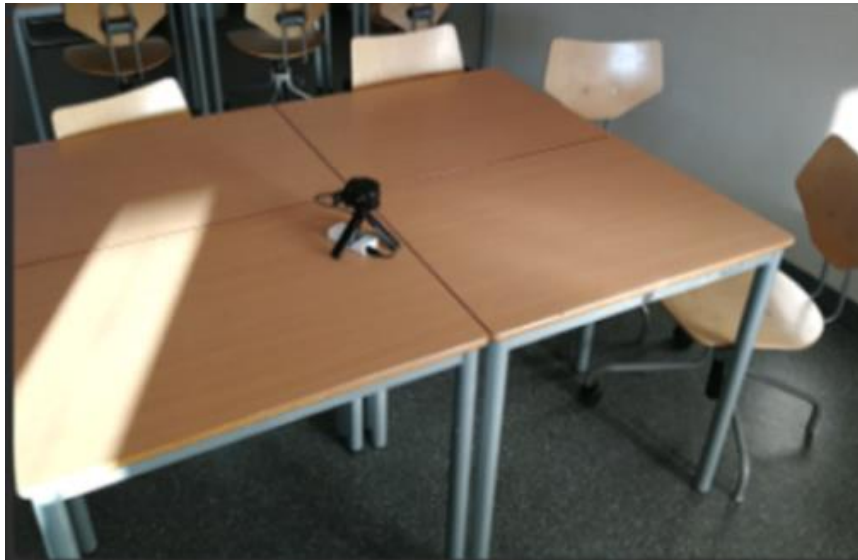


Figure 4. Student and camera placement (Photo: private).

The classes were held in an ordinary classroom (not the school kitchen) when they would usually have FH, and each lesson lasted for two school hours (2x45 min).

The Ph.D. student arranged the desks and chairs and placed the cameras correctly before the class started. The cameras were also turned on before the students arrived so this would not be a distraction after the class had started.

When the students arrived, the Ph.D. student welcomed everyone and presented herself. Then, the assistants presented themselves before starting the class. By then, the Ph.D. student withdrew to the back of the class, observed passively, and took notes throughout the lesson.

Immediately after the class, the Ph.D. student sat down with the students for 5-10 minutes, like an FGD, to listen to the student's experiences and opinions of the

activities. After that, a similar interview with the FH teachers and the assistants was conducted. Teacher/student experiences and further recommendations were considered valuable in working forward with the activities.

To analyze how the activities worked, the recorded material was watched several times by the Ph.D. student. Social interaction and dialogue were central elements when analyzing the activities as these correspond to SCL. Therefore, both student-student interaction and student-teacher interaction was regarded as valuable. In selecting the sequences, the focus was to find sequences where the tasks engaged the students in dialogue and interaction and where the students did not engage in such interaction to illustrate both. After finding several interesting sequences, a selection of these was watched together with the co-authors. Finally, six sequences were chosen to be included in the paper.

As for the FGDs, all parents provided written informed consent for their children to participate while the students provided assent. The teachers and assistants, however, provided oral consent. Furthermore, students not participating in the testing were working on an alternative task arranged by the FH teachers in a different room, all per the Norwegian Centre for Research Data (2018). To protect personal data, still frames from the recorded material were hand-drawn by the Ph.D. student and included in the paper. These drawings, along with quotes from each learning task, illustrate the findings from the analysis.

5 Summary of results

In this section, the main findings from Papers I to IV are presented. For additional details, in addition to tables and figures, please see the papers attached.

5.1 Paper I “The state of learning activities in teaching Home Economics: A cross sectional study in Norwegian schools”

Regarding the first aim of this thesis, with special emphasis on learning activities, this first paper aimed to examine the use of exploratory/experimental activities, flipped classroom, activities where students are encouraged to use their senses, and digital tools in FH. It also explored which factors teachers report as barriers and promoters to teaching and learning among students in this subject.

A total of 1170 teachers completed the questionnaire, of which 85% were women. Of the teaching in FH, about 80% of the time was dedicated to practical cooking.

Regarding the use of the different learning activities in FH, 71% used activities where students are encouraged to use their senses, which was the highest of all four activities. This was followed by exploratory/experimental activities (65%), digital tools (56%), and flipped classroom (14%). Most teachers (74%) reported that they wanted to use flipped classroom more often. This was followed by exploratory/experimental activities (71%) and activities where students are encouraged to use their senses (68%). 50% of the teachers wanted to use more digital tools in their teaching. The teachers used exploratory/experimental activities and activities where the students are encouraged to use their senses mainly because they believed this was beneficial regarding students' learning outcomes. Student creativity and motivation was also an important reason. Digital tools and flipped classroom were mainly used for variation purposes. Finally, exploratory/experimental activities and flipped classroom were mainly used to promote cooperation.

Regarding which factors teachers believe are important barriers to good teaching in FH, lack of equipment (97%), non-optimal premises (96%), and economic factors (94%) were the three most important factors selected by the teachers. This was followed by few hours for the subject (91%), collaboration with leaders

(87%), timetable issues (84%), lack of formally qualified teachers (77%), the status of the subject (74%), and finally problematic working relations with colleagues (67%).

Regarding what promotes learning in FH, engaged teachers were regarded as important or very important by all teachers. Lots of practical cooking and necessary equipment were regarded as important or very important by 99% of the teachers. This was followed by motivated students and good premises for teaching (both 98%), having a combination of practical and theoretical teaching (95%), good economy (94%), using a variety of learning activities (93%), formally qualified teachers (79%) and, finally, lots of theoretical teaching (51%).

5.2 Paper II “Differences in formal education among Norwegian Home Economics teachers”

Also relating to the first aim of this thesis, and more specifically with an emphasis on teacher competence, this second paper aimed to explore potential differences between teachers with formal versus no formal subject-specific FH education.

Of the 1170 teachers who completed the questionnaire, 43.8% were formally qualified FH teachers (called the EDU group).

A higher percentage (48.6%) of the teachers teaching at lower secondary school had formal FH education (data not shown), and a higher proportion of the EDU group taught at this level compared to the teachers with no FH education (called the no-EDU group) ($p \leq 0.001$). A higher proportion of the EDU group teachers were younger ($p \leq 0.001$) and had more years of experience teaching FH ($p \leq 0.001$).

Compared to the no-EDU group, there was a higher proportion of the EDU group who showed contentment with teaching FH ($p \leq 0.001$) and reported to a larger extent to master their teaching of FH ($p \leq 0.001$). Still, between 89% and 97% of the teachers across both groups reported a high degree of contentment and mastery of their teaching. However, a higher proportion of the EDU group favored a renewal of the subject compared to the no-EDU group ($p = 0.01$).

Relating to the use of the basic skills in teaching FH, a higher proportion of the EDU group reported using the basic skill of writing in FH classes ($p = 0.02$).

Still, no significant differences were found regarding the inclusion of the other basic skills (being able to express oneself orally, read, do mathematics, and use digital tools), gender, use of dietary guidelines in teaching, the ability to influence students' attitude towards nutrition and health, the FH teacher being a resource in health promotion among students, nor in experience of the subject having relevance for society.

5.3 Paper III “The mismatch between teaching practices and curriculum goals in Norwegian Home Economics classes: a missed opportunity”

This paper aimed to explore teachers/student perspectives and experiences of current classroom practices in FH and to use this feedback in the development of the LifeLab learning tasks. Therefore, this paper stands in between both the first and the second aim of the thesis as it explores teachers/student experiences (mapping at school level) and because it is used as a basis to develop the learning tasks (development).

Overall, FH is a highly valued and popular subject among students and teachers. The analysis of the FGDs resulted in three main themes: 1. students and teachers value cooking, 2. limited time, and 3. pedagogical solutions to resolve the mismatch.

Theme 1 represents the enjoyment and prioritizing of cooking and preparing food in FH classes. According to the students, the enjoyment of cooking and eating was reported as the best things about the subject. They also enjoyed the possibility to be social during class. Based on descriptions of the FH subject provided by the students, it was clear that all three schools had a similar structure to the classes; within 2- 2.5-hour time frame for each lesson, the teachers first demonstrated or explained for the students what they were going to do, then the students cooked 2-3 dishes, ate, and finally cleaned up. Therefore, as this left very little time for working with other topics related to the more theoretical parts of the curriculum, the teachers introduced the theory by talking about it during or after mealtime, during cooking, or as home assignments for the students.

Theme 2 represents the experience of time scarcity in FH lessons. The teachers believed more hours for the subject would strengthen teaching quality in FH as time scarcity limits what they can achieve. The teachers expressed a great desire to have more time allocated for each lesson. This would solve several challenges, like including more experimental activities or working more with the curriculum's theoretical aspects. Limited time was therefore experienced as the most significant barrier to teaching differently.

The final theme represents the eagerness to do more and suggestions provided by the students and teachers regarding the new learning tasks. Although the students enjoyed the possibility to cook and eat in FH classes, many were positive towards learning more about nutrition and health-related topics, as they believe this is both important and interesting to learn. If so, they wanted to learn in a student-active way. The students appreciated variation in activities and the possibility to be active in class. Fun was a word often used. The teachers also supported the importance of active and practical learning tasks. Ownership of what they do in class was important for the teachers. Therefore, the learning tasks to be developed must be flexible and easy to use. Finally, the activities must benefit the students following the competency aims in the subject.

5.4 Paper IV “Is there any sugar in bread?”: A qualitative video analysis of student active learning tasks in Food and Health (Home Economics)”

As part of this thesis's second and final aim, testing of the LifeLab learning tasks, this paper aimed to explore how three of the learning tasks developed in this project can contribute to active learning among students during a FH lessons by taking a sociocultural approach to learning.

By adopting an SCL approach, we found the activities to activate the students in various degrees. The learning tasks required the students to interact and discuss together. They also had to be self-driven to complete the tasks. Consequently, when some students finished the tasks before the rest of the class, they began to talk about off-topic matters.

We saw especially the picture ranking tasks to create opportunities for the students to communicate and collaborate, which facilitated them in learning the content and reaching the task's learning objectives. However, some students were

more engaged than others which may benefit their learning outcome more than the more passive ones. Also, even though the students were instructed to argue and discuss the order, some only presented statements and facts, prohibiting a fruitful discussion and exchange of understandings on the matter. We also found students using the words “healthy” and “unhealthy” when discussing the different food items, despite the teacher using the word “nutritious.” Finally, the sugar content was often used as the premise for something being healthy or not when the students discussed the different pictures.

Where the assistants and the FH teachers provided scaffolding, by e.g., asking follow-up questions, was valuable for engaging the students. This highlights the important role of the teacher in classroom settings. The class discussion after the group work also involved the students in the decision-making process. This was useful in clarifying potential misunderstandings or shortcomings in nutrition knowledge among the students.

The 5 a day learning task did not facilitate or require substantial interaction, except when deciding on the amount to collect at the beginning of the task. However, it did visualize the recommended amount of fruit and vegetables to consume each day and hence served as a tool for learning during the task and during the review.

During line game, the most successful element was the use of the two breads to demonstrate the bread scale and start a conversation on food labeling and the theory that serves as a foundation for the national recommendations on whole-grain products. Using these tools for learning engaged the students more than when they only got statements presented. In those cases, the students' focus decreased after just a few statements. Also, as the students judged the bread by their looks, they were surprised to see the level of whole grain when the teachers presented the packaging with the bread scale on it.

6 Discussion

6.1 Discussion of main findings

The aim of this thesis was twofold: first, to map teaching practices in FH in Norway, both at the national level and the school level, with special emphasis on learning activities, teacher competence, and experiences among FH teachers and students in Norway; second, to develop and test different student-activating learning tasks aiming to strengthen comprehensive FH education.

In this section, the findings' discussions are divided into three parts; first, the findings relating to actual teaching practices (mainly Paper I and III). Then, a discussion on teacher competence and its implications for teaching and learning in FH (Paper II) is discussed, followed by a discussion of the LifeLab learning tasks (Paper IV).

Chapter 6.2 will be a discussion of the methods used in this project.

6.1.1 Teaching practices and implication for comprehensive FH education

Taking a step back to the recommendations provided by the WHO (2006, 2015), European Commission (2014), and the Norwegian Ministries (2007), students are recommended to learn a variety of practical life skills like consumer awareness, nutrition, and practical cooking. More importantly, these skills are also outlined in the FH curriculum (Directorate for Education and Training, 2006). However, our findings suggest that FH classes' main concern today is developing students' practical cooking skills. According to our interviewees, students prepare food and eat together every FH lesson, with only a few exceptions. This is the “normal” FH class, as observed by Veka et al. (2018). Similarly, our survey revealed that around 80% of the time in class is spent on practical cooking, which is in accordance with the findings from Bottolfs (2020). The FH curriculum includes much more than just developing students cooking skills, as discussed in Paper III and previously in this thesis. After 7th grade, it is, amongst others, about students being able to “discuss product information and advertising for various foods,” “assess, choose and shop with environmental awareness,” and “talk about guidelines for healthy eating from the health authorities, and provide examples of the relation between eating, health and lifestyle” (Directorate for Education and Training, 2006, p. 3). After 10th grade, they take this further, as the students

should be able to “discuss and elaborate on how different marketing methods might influence the choices of foodstuffs consumers make,” “assess and choose foodstuffs based on ethical and sustainable criteria,” or “inform others about how eating habits might influence diseases that are connected to lifestyle and eating” (Directorate for Education and Training, 2006, p. 4). Hence, there are many competencies the student will acquire through FH, which can help them make healthier choices. These competencies can relate to health promotion and empowerment in that they remove obstacles to change and enable the students to improve their health through informed decision-making (Glanz et al., 2015; World Health Organization, 1986). However, these competence aims require quite in-depth knowledge of the topics and therefore requires students to work actively with it in class. Still, the teachers interviewed in our study expressed they did not have the time to provide high quality education relating to these theoretical matters of the curriculum due to time constraints. Still, they cooked several dishes within each lesson, indicating a priority for cooking-related activities. In accordance with the FH curriculum, researchers conclude that more comprehensive approaches to food and nutrition education are recommended in order to influence people’s dietary behavior (Hollywood et al., 2018; Lavelle et al., 2020; McGowan et al., 2017, 2016; Seeley et al., 2010). As cooking skills are only one of many important competencies needed to adhere to a healthy lifestyle, strengthening the broader scope of FH education is necessary if the subject shall be able to serve as an important contributor to health promotion by helping the students reach the competence aims outlined in the curriculum.

The subject's practical structure was highlighted as valuable by both teachers and students interviewed in our study. The students enjoyed cooking, eating, and socializing together and described FH as fun. This popularity of FH and the practical-aesthetical subjects among students are reported in both Norway and other countries (Holthe et al., 2013; Øvrebø, 2014; Paas & Palojoki, 2019; Rutland & Owen-Jackson, 2015). The classes observed by Holthe et al. (2013) revealed similar results where the teachers express that the subject appeared to be a break in an otherwise theoretical school day and that the practical element was important to preserve. Since the subject is experienced as an enjoyable break during the school day, this implies that there is not as much cognitive engagement during these classes as other subjects, which signaling again that the focus is on cooking, socializing, and sharing a meal. Although valuable, this

challenges the extent the students acquire the defined competencies in FH. This corresponds with the findings from Taar (2017), who encourages HE teachers in Estonia to include more cognitive-oriented learning tasks into their teaching. Øvrebø and Engeset (2020, p. 158) state that (authors translation): “in a practical lesson, it is essential that students do not get too much theory. The best theory education is perhaps the one they get by working with nutrients on the Diet Planner (*Kostholdsplanleggeren* in Norwegian).” This again indicates a preference for cooking, reducing theory to be solely about nutrients in food, working against comprehensive FH education as described in the curriculum. As stated earlier, comprehensive food and nutrition education is key in impacting dietary behavior (Hollywood et al., 2018; Lavelle et al., 2020; McGowan et al., 2017, 2016; Seeley et al., 2010) and thereby promoting health and reducing social inequalities in health. Based on current findings, theoretical topics should be strengthened rather than disconnected from practice and reduced to nutrients.

Øvrebø (2014) found the FH subject not enhancing students’ knowledge and attitudes as expected from the curriculum and proposed better integration of theory into practical learning activities. A practical approach to the theory would be advantageous because of the practical outline of the subject and because this is what students and teachers value. A student interviewed in this study (Paper III) described how they learned the theory relating to fish two weeks after they prepared fish. He then suggested they learn about fish that same lesson when asked what other ways theory could be taught. This is an excellent suggestion. Still, despite wanting to include more theory, the teachers stated there is no time to do so during the same lesson. From the teacher interview at the same school, it was clear they had pure theoretical classes only a couple of times during the school year. Hence, theory and practice were taught separately. Acquiring knowledge relating to theory was primarily based on the students' self-efforts, which is not sufficient from a pedagogical perspective. Therefore, schools adhering to this practice need to consider how they can structure their FH lessons differently to enhance student learning.

As both Norwegian and Swedish HE research indicate, following recipes with little emphasis on creativity is common in HE education (Espeland et al., 2013; Höijer et al., 2011; Veka et al., 2018). Veka et al. (2018) call the recipe the “hidden curriculum” since teaching practices in their observed FH classes were

so strongly guided by it. The recipe hence became decisive in what knowledge and practical skills the students acquired through FH. This is a narrow approach to the FH curriculum, where practical, creative work is important. Furthermore, the issues highlighted by Holthe and Wilhelmsen (2009) regarding such teacher-led approaches to learning in FH classes and its implications for students' ability to create, experiment, and develop critical thinking need serious attention. Our findings (Paper I) revealed that 65% of the FH teachers used exploratory/experimental activities in their teaching. Furthermore, half of the teachers reported using exploratory/experimental activities less than once per month or never. According to one of the teachers interviewed in Paper III, limited time was a barrier to include such teaching practices, despite wanting to include it more often. Another teacher stated that activities where students get to explore more on their own were valuable for increasing their learning outcomes. This was also the main reason for using such activities according to our survey. Therefore, it is problematic that students do not get to work with such activities more, and there is hence a need for improvement. Although both the trial-and-error approach and creativity are highlighted as important principles in the subject (Directorate for Education and Training, 2006), one of the competence aims after 7th grade is “to make food according to recipes” (Directorate for Education and Training, 2006). This directs the teaching, at least the teaching relating to cooking, away from creativity and trial-and-error approach. However, after 10th grade, this is replaced with “create and test new dishes based on different raw materials, ways of preparing them and food cultures” (Directorate for Education and Training, 2006). This encourages a more explorative and creative approach to cooking, more in line with the subject's objectives. A solution to this teacher-lead approach would be for teachers to include the students more in decision-making processes (Holthe & Wilhelmsen, 2009, p. 30) so the gap between school practices and what the students do at home is as narrow as possible, as discussed by Palojoki (2003). Elements like budgeting and food selection are an important part of food skills, and together with cooking skills, might impact dietary behavior (Lavelle et al., 2020). Therefore, it could be valuable to emphasize such processes in HE classes. By including the students more, the learning in HE classes becomes closer to the learning experiences in everyday settings, such as home, which is important for the students' learning. Although we did not explore this in our study, the students interviewed saw the

value and importance of the FH subject, indicating they see the link to everyday life.

According to the findings in Paper I, few hours for the subject could be an important barrier to good teaching. However, this was a legitimate barrier described by the teachers interviewed in Paper III. In studying the importance of time frames in HE education in Sweden, Lindblom et al. (2016) question whether the curriculum aims fits within the available timeframe. HE is the smallest subject in Sweden as well, even smaller than FH, with 118 teaching hours, respectively (National Agency for Education, 2020). In their study, they found finishing on time being more important than the process of cooking itself, with the timeframes leading to pressure on the students (Lindblom et al., 2016). As a solution, the authors suggest more experimental cooking (e.g., how one can make food cook faster), followed by a discussion and reflection on how the experiment went. This can facilitate learning by placing more emphasis on the process itself rather than the end-product. Finally, using the knowledge to compose a full meal could wait until the end of the semester, rather than ending all lessons with a full meal (Lindblom et al., 2016). As it is not realistic to assume that the FH subject will be granted more hours by the government in the near future, it could be interesting to test these suggestions in Norwegian FH lessons. Also, the approach proposed by Lindblom fits with the Norwegian FH curriculum, which emphasizes the importance of experimenting and the trial-and-error approach (Directorate for Education and Training, 2006).

Another solution to the teachers' time pressure can also be to use flipped classroom to a greater extent. A small number (14%) of teachers in our survey (Paper I) used a flipped classroom approach in their teaching, but most of them used it less than once per month. As the results from Paper III found teachers demonstrating for the students at the beginning of the class, adopting a flipped classroom approach could help make classes more efficient. By flipping the classroom, the students can watch instructional videos at home before class and possibly also practice at home as homework. However, the latter will require parents to have appropriate tools and foods at home, so this may have to be addressed prior. However, watching an instructional video before cooking can be effective when learning a new cooking skill or reinforcing a more advanced technical skill (Surgenor et al., 2017). In HE, Surgenor et al. (2016) found such

videos motivating students to experiment, cook at home, in addition to improve their cooking skills. Interestingly, compared to the other activities explored in Paper I, the flipped classroom was the activity most teachers wanted to use more often, indicating they see the value of such an approach to teaching and learning. In the new FH curriculum, using digital tools is described in the competence aims after both 7th (use digital resources to compare and discuss product information and advertising in different media) and 10th grade (use digital resources to assess their own diet and to choose healthy and varied foods in connection with cooking) (Directorate for Education and Training, 2019b, p. 6). Hence, including digital tools will be essential in providing opportunities for students to develop these skills. As 56% of FH in our survey used digital tools in FH, teachers not including this must consider how they can incorporate digital tools into their lessons in the teaching onwards to comply with the new curriculum.

The Ministry of Education and Research (2019, p. 19) states that many have perceived the practical and aesthetic subjects becoming more theoretical after the knowledge promotion reform in 2006. According to our research findings, this is not apparent in how the teaching is performed. The subject is still highly practical, with a strong focus on cooking. Therefore, it is relevant to question whether solely the curriculum became more theory-driven in 2006, while teaching practices did not change accordingly. Holthe et al. (2013) discuss this in their paper and express that teaching practices in the practical-aesthetical subjects, such as FH, are characterized by stability, and little development work has been done relating to the knowledge promotion reform in 2006. From the very beginning of FH education a hundred years ago, practical work in the kitchen has always been central (Askeland et al., 2017). This may explain the strong focus on developing cooking skills in current FH classes. Still, one would expect that if the curriculum included more theoretical content, with a lesser emphasis on practical work relating to cooking, the teaching practice would also have a stronger focus on the theoretical content. Although the majority of FH teachers in the latest school subject survey agreed that FH is a first and foremost a practical subject, some expressed that they perceived the practical element of the curriculum as weak and that this was a disadvantage (Espeland et al., 2013, p. 122). However, the new FH curriculum, valid from 2020, seems to place even greater emphasis on cooking compared to the 2006 curriculum. It states, amongst

other elements, that the students should develop knowledge about a health-promoting diet through cooking and preparing food (Directorate for Education and Training, 2019b). Given how FH classes are organized, it seems like this is already how this is communicated to students today as the teachers talk about the theory before, during, or after cooking. However, according to the Ministry of Education and Research (2016), active participation is essential for student learning. Also, the findings from the OECD project, summarized by Dumont (2012), and SCL (John-Steiner & Mahn, 1996; Rogoff, 2008; Säljö, 2001; Vygotsky, 1978) all emphasize the social nature of learning and the importance of students talk and participation. Therefore, students should be offered the opportunity to work more actively with the curriculum's theoretical concepts in FH classes, through problem-solving, discussing, or reflecting critically upon food and health topics. One teacher interviewed in Paper III raised a concern regarding whether the students acquire this knowledge the way FH lessons are run today. Therefore, he argued for teaching these theoretical aspects differently and placing more emphasis on it during classes, supporting a more comprehensive approach to FH.

Despite the curriculum focusing on multiple aspects of food and nutrition education, it still seems like cooking-related activities are the be-all and end-all of FH education. Still, the theoretical content can easily be taught and learned through other practical learning tasks. Practical does not necessarily have to mean cooking, as demonstrated by the learning tasks developed in this project, which will be discussed later.

6.1.2 Teacher competence and implications for FH education

As mentioned in the introduction, a well-known concern regarding the FH subject is the low proportion of qualified FH teachers (Lagerstrøm et al., 2014; Perlic, 2019), which was confirmed in our survey. Following previous research, we found even less competence among teachers at the primary school level (grades 1-7) than the secondary school level (grades 8-10). As there are no requirements for teachers having FH competence to teach FH at the primary school level, this was not unexpected.

Regarding potential differences between teachers with and without formal FH education, the formally qualified teachers felt to a larger extent to have mastered

their FH teaching compared to the non-educated teachers. However, both groups felt to a large degree to master their teaching in FH (97% and 89% selected very large or large extent). These findings correspond to the school subject survey (Espeland et al., 2013). This questionnaire examined how FH teachers at the primary school level judged their own competence in planning, conducting, and assessing in FH. They found virtually every teacher assessing their own ability between quite high and high on a six-point Likert scale. No one selected that they had low competence. Regarding teachers perceived competence within the three subject areas in FH (food and lifestyle, food and culture, and food and consumption), the results were similar, with most teachers perceiving their competence between quite high and high. No one believed they had no or low level of competence despite nearly half of the teachers only having between 0-15 ECTS in FH. The authors, therefore, assume that the teachers draw on their personal experiences when assessing their own competence, which was confirmed by one respondent who stated that even though she did not have ECTS in FH, she had lots of practical experience after twenty years as a mother/housewife (Espeland et al., 2013, p. 109). This statement reveals that this subject's comprehensiveness and complexity are not acknowledged, feeding the assumption that the subject has low status and can be taught by "anyone." As we explored to which degree the FH teachers felt they mastered their teaching and the questionnaire by Espeland et al. (2013) explored competence in planning, conducting, and evaluating in FH, both findings show similar tendencies and draw attention to something that may be interesting to explore further. Also, while the school subject questionnaire only included 67 teachers in FH back in 2011 (Espeland et al., 2013, p. 105), our study presents data from 1170 FH teachers in 2018, contributing greatly to the knowledge base, which today is still limited.

In our survey (Paper I), most teachers believed the lack of formally qualified teachers was an important barrier to good teaching. Still, less than half of the respondents were, in fact, formally qualified. This implies that some of the unqualified teachers recognize that this affects the teaching negatively. This represents a mismatch between perceiving that a lack of qualification affects teaching negatively and a feeling of mastering the teaching with no formal competence, assuming mastering the teaching means supporting student learning.

A total of 79% believed formally qualified teachers were important or very important for learning, leaving 21% believing this is less important. Interestingly, all teachers believed engaged teachers were most important for learning, which may explain the 21% believing qualification being less important. They may believe engagement is more important than formal qualification. Still, we did not examine who these teachers were, so no conclusion can be drawn.

The low level of qualified teachers in FH may impact how the students acquire the competencies outlined in the curriculum. It is supported in the literature that teachers' subject knowledge is an important teacher quality (Blank & de las Alas, 2009; Darling-Hammond & Youngs, 2002; Metzler & Woessmann, 2012). This also stands as a cornerstone for why increasing teacher competence in Norway is of national priority (Ministry of Education and Research, 2014, 2015a). The WHO also recommend HE teachers hold an appropriate qualification and that they get the opportunity to improve their competence (World Health Organization, 2006). In Sweden, unqualified teachers in HE have even been found to transfer norms and values that lay outside the curriculum to a larger extent than qualified HE teachers (Håkansson, 2015, 2016). We do not know if this is evident among Norwegian FH teachers, but still stresses the importance of enhancing teacher competence to ensure the students acquire the set of competencies outlined in the curriculum.

For teachers who lack FH competence, it might be more difficult to successfully implement and use the learning tasks developed in this project appropriately due to a lack of competence regarding the curriculum's theoretical aspects. It might be perceived easier to prepare a meal with the students if you have a personal interest and experience of cooking than it might be to lead a class discussion regarding sustainable food consumption or how food works as bodybuilding substances, as proposed in the curriculum, if you lack such competence. If we expect students to acquire competence relating to all aspects of the FH curriculum, we should require FH teachers to possess the same. How can they otherwise educate the students adequately in such complex matters as which food and health? It is more than just learning how to follow a recipe and prepare a meal properly.

6.1.3 LifeLab learning tasks in food and health education

To strengthen comprehensive FH education in accordance with the curriculum and recommendations from the WHO and European commission stated earlier, we developed several student activating learning tasks for FH in 6th and 9th grade targeting the more theoretical aspects of the curriculum. The three learning tasks analyzed will be discussed in this section.

During the picture-ranking task, we saw that the students often used the words “healthy” and “unhealthy” when talking about the different pictures, despite being told to rank them based on most to least “nutritious.” This is not surprising since “healthy” and “unhealthy” are often used in everyday life. Lassen (2020) found FH teachers often use everyday language, like talking about choosing “healthy food,” instead of professional language, like choosing “food in accordance with the recommendations from the health authorities” in their teaching. The use of everyday language was also found by Veka et al. (2018), whose concern is that this may weaken the impact regarding FH being a general study subject, which is described in the curriculum as helping students get “insight into and the ability to choose and reflect critically on food and meals” (Directorate for Education and Training, 2006). To what degree the FH teachers included in our study use everyday language in their regular teaching was not explored, and so any conclusions regarding this cannot be drawn.

Øvrebø (2014) found students’ knowledge of fruit and vegetables was lower than expected after having FH. Furthermore, only 40% of the students surveyed stated that they learned about nutrition in FH classes. Therefore, another explanation for this dichotomic phrasing among students in our study is that their nutrition knowledge regarding the different food items was too low for this kind of task. If the students do not know the nutritional value of the different items they are ranking, it is difficult to discuss it. As FH teaching focuses more on developing practical cooking skills than on learning the more theoretical aspects of food and nutrition, this explanation might be accurate. However, if the students shall develop the competence in making nutritionally sound food under the health authorities’ recommendations or be able to reflect on the relationship between food and health outcome as stated in the curriculum, a certain amount of nutrition knowledge is needed. The students also focused a lot on sugar content and

ranked the picture mostly based on this premise. This might be explained by the students at school 3 and the first group at school 2 measuring the sugar content of similar food items prior to arranging the pictures. They also watched the video which discussed sugar content in juice and chocolate milk, two of the items they were arranging. It may also be because sugar generally is something of focus in society in general. The goal of the picture-ranking task was to raise the student's awareness regarding the difficulty of ranking different items and, at the same time, raise their awareness regarding the nutritional value of the different items. Hence, the "healthy" or "unhealthy" aspect of food was problematized and discussed with the whole class. The students were encouraged to discuss and collaborate as a group and thereby agree through argumentation. Such exploratory talk is described by Mercer (2002) and has implications for learning, as shown by Taar (Taar, 2017) in the HE context. Despite the benefits of exploratory talk on students' learning process in our study, the students struggled to do so, and not all students engaged fully in the learning task, and therefore are likely to fall outside this effect. As discussed earlier, this skill needs to be taught (Gillies, 2003; Maloney & Simon, 2006; Taar, 2017). Therefore, teachers being "visible" in the classroom by visiting the groups as they work and asking probing questions can help students stay focused and increase their learning outcomes.

During the picture-ranking task review, the students were asked "why" questions, letting them provide suggestions and insight. This facilitated students providing relevant information, while the teacher supplemented with follow-up questions, additional information, or relevant corrections. It was also highlighted that there was no simple right or wrong order to place the pictures so that the students should not be restricted by being embarrassed about answering incorrectly. Realizing that there was no right or wrong answer was part of the task.

During the line game, we saw that the use of the two breads captured the students' focus to a larger degree than not having anything to illustrate. From an SCL view, these served as educational tools (Vygotsky, 1978). This also makes the task more practical and "hands-on" as the students had to examine the breads. The other questions did not have any props to illustrate, and the students, therefore, just had to listen to the claims and then decide. Consequently, the students lost interest after a few statements. This learning task could be included in a lesson where the students make, e.g., whole-meal bread, to connect

knowledge of the bread scale to a practical task in the kitchen. This way, theory and practice are connected, and the students can clearly see the relevance of food labelling.

Although the 5 a day task did not facilitate discussions among the students to the degree of the picture-ranking task, it illustrated the health authorities' recommendations. Most students included potato in their selection, indicating that they believed this was part of the recommendations. Hence, this was clarified with the assistant's explanation of what place the potato has in our diet. Also, after peeling the fruit, they were surprised to see how much weight it had, and it illustrated the net amount recommended to consume each day. During this task review, some students were more interested in the tools (peel, scale, and calculator) than focusing on what the teacher was saying, indicating that students easily got distracted while the teachers were doing most of the talking. Hence, the tools were not always a tool for learning but a distraction, working counterproductive.

To summarize, based on the mapping of teaching practices and the teacher/student experiences in FH as part of this thesis's first aim, we found low levels of formally qualified teachers in FH and that the theoretical elements of the curriculum were not given priority in FH lessons. This may have implications for how comprehensive the teaching is and whether the students acquire all the competencies highlighted in the curriculum. This, in turn, may have implications for how much this subject can contribute to health promotion among the students. Relating to this thesis's second aim, we developed and tested different learning tasks targeting the more theoretical elements of the curriculum. The learning tasks activated the students in different ways and challenged them in communication and interaction. Also, both students and the FH teachers enjoyed the practical outline, indicating that students enjoy working with theoretical topics if they work with it in a student-active, practical way.

6.2 General methodological consideration

The LifeLab FH project consisted of both quantitative and qualitative research methods, as described earlier.

For Paper I and II, we used cross-sectional data (questionnaire) to map the use of learning activities, teacher competence, and experiences among FH teachers in Norway at the national level. Then, to explore teaching practices and experiences among students and teachers in the FH subject at the school level for Paper III, we conducted FGDs with teachers and students. After the FGDs, the learning tasks were collaboratively developed through workshops.

Finally, video recording and classroom observation were used to analyze the developed learning tasks in Paper IV.

Methodological considerations regarding the different parts of the project will be discussed in the forthcoming section.

6.2.1 Cross-sectional study (Paper I and II)

For Paper I and II, we collected data through a web-based, self-administered questionnaire distributed by email to all primary and lower secondary schools in Norway (N = 2821). As the questionnaire was anonymous, we did not have direct contact with the individual FH teachers. Therefore, the head teacher at each school was asked to distribute the email containing the questionnaire's link to their teachers in FH. As a result, the head teacher also received the reminders, kindly asking to redistribute this to their teachers. This reminder resulted in a significant increase in responses (from 300 respondents before the first reminder to > 900 respondents shortly after). When the questionnaire was closed two weeks after the second reminder, 1170 teachers completed the whole questionnaire, providing us with the largest questionnaire data among FH teachers in Norway to date. As our questionnaire was relatively short (approx. 10-15 minutes response time) and we thanked the ones who had already responded in the reminder, this may explain the high number of responses registered after the reminder, as shorter electronic questionnaires and a statement about others having responded can increase response rate (Edwards et al., 2009). However, since the questionnaire was anonymous, we do not know how the data is spread geographically. Also, the total number of teachers who teach FH in Norway is unknown, so we do not know how many FH teachers out of the total number of FH we reached.

To ease the analysis process and ensure comparability between each respondent, we included several closed-ended questions (Polit & Beck, 2014), where we pre-specified the response alternatives. However, these questions may inhibit potentially valuable findings that could have been acquired through open-ended questions (Polit & Beck, 2014). Concerning this, we included several five-point Likert scale questions, which allowed us to quantify gradations in the individual respondents (Polit & Beck, 2014). This, however, may increase the chances of respondents answering several of the questions the same way, e.g., answering “to a large degree” or “to a very large degree” to all questions (Moy & Murphy, 2016). This superficial nature of questionnaires, which does not allow insight into any complexity of the phenomenon explored, must be considered when interpreting the data.

Furthermore, to facilitate the questionnaire's complete responses, respondents had to select an answer to proceed in the questionnaire. Instead of skipping a question, this might have resulted in respondents selecting an answer that does not entirely “fit” their personal view to continue. During a questionnaire, there is also a chance that the respondents misinterpret the questions and response alternatives (Moy & Murphy, 2016). Therefore, questionnaire data must be interpreted with caution.

As the researcher cannot provide prompts, providing clear and easy-to-understand questions is important (Bryman, 2016). Still, respondents may interpret the meaning of the questions differently. Furthermore, when respondents answer what they believe is perceived to be socially acceptable, social desirability bias is another common measurement error in survey research (Moy & Murphy, 2016, p. 19). However, self-administered questionnaires like ours diminish this effect (Bryman, 2016). Another limitation to consider regarding self-reported data is the possibility of respondents not remembering and thereby not providing precise answers, e.g., how often they use digital tools in their teaching.

Despite its limitations, given the large number of respondents reached, this approach was considered appropriate for data collection. The questionnaire could be answered on any electronic device (computer, tablet, and smartphone), which was convenient for the respondents as they could answer at any time. The

electronic format also makes administering and analyzing the data less time consuming, compared to paper-based questionnaires. As our findings do not explore any phenomena in depth, the findings highlight certain aspects that might be relevant to explore further through qualitative approaches, such as FGDs.

6.2.2 Development of the LifeLab learning tasks

A strength of this thesis is the involvement of relevant stakeholders in the development of the learning tasks. To increase the chances of developing learning tasks relevant and valuable for students and teachers' work, we conducted FGDs with both groups to let their voice be heard. We also included teacher-students specializing in FH in the development (workshops). This provided valuable input to consider relating to pedagogics in addition to the general guidelines outlined in public white papers regarding school and teaching, other literature on learning, and supervision by trained educators.

The schools included in this project were conveniently selected (Battaglia, 2013). We contacted schools familiar to the teachers training at UiA, who were known to have engaged teachers who hold formal FH competence. This was considered valuable, as we believed this engagement and competence was important in developing the learning tasks. This, however, may have provided different feedback compared to other teachers with a different background, which constitutes most teachers working as FH teachers in schools today. Still, the feedback from teachers with FH competence was considered more important than including more teachers without FH competence just for the sake of balance between teachers with and without FH competence. Also, as all three schools invited to participate in the project decided to participate, both the head teachers and FH teachers value the project and participation, and engagement with and commitment to the subject were present.

6.2.3 Focus group discussions (Paper III)

Qualitative methods are considered valuable for understanding people's experiences (Merriam, 2009). Therefore, as we aimed to explore the FH subject's teacher/student experiences, this approach was regarded as most appropriate. FGDs allows us to get insight into how people "make sense of a phenomenon and construct meanings around it" (Bryman, 2016, p. 502). Also, students in our age group (age 11-14) tend to be more relaxed and free-speaking when

experiences are shared in a group of peers (Horner, 2000). We also conducted the FGDs at the schools, in familiar surroundings for all participants. Also, we used a semi-structured topic guide to facilitate more natural conversation, hoping to make it more comfortable for the participants. However, limitations of FGDs that must be considered are the possible effects of group effects (Bryman, 2016, p. 522), which are especially evident among middle schoolchildren, where peers serve as important role models (Horner, 2000).

As the Ph.D. student had limited experience conducting FGDs, interview guides were developed in collaboration with a more experienced researcher in the supervision team. The first two interviews were also lead under the guidance of the same supervision team member.

Thematic analysis (TA) outlined by Braun and Clarke (2006) was used to analyze the findings. As TA is not bound to any theory, it is a flexible approach, which provides core skills in analyzing qualitative data, useful for novel qualitative researchers (Braun & Clarke, 2006). Still, trustworthiness and authenticity are important principles in assessing qualitative research (Bryman, 2016). Therefore, to familiarize herself with the methodology, the Ph.D. student participated in a TA training course in addition to ongoing dialogue with trained qualitative researchers with experience using TA. Also, codes and themes were discussed with several of the co-authors during the analysis's final stage. However, the whole coding process should ideally be conducted by a team of researchers to enhance the trustworthiness of the analysis (Nowell et al., 2017). Due to limited available resources in this project, this was not feasible and is, therefore, a weakness to be considered. However, to address this, the Ph.D. student and the main supervisor coded one complete transcript to check for coherence. These were then discussed before the Ph.D. student continued working with the coding. Also, to determine the fit between what the interviewee has said and the researcher's interpretations of it, a member check is recommended (Nowell et al., 2017), but was not performed in this study.

Also, since three schools were included in the project, these were the ones applicable for FGDs. Therefore, data saturation (Bryman, 2016, p. 412) was not guaranteed at the beginning of the project but did still occur by the final FGDs.

As the facilitator in all interviews, the Ph.D. student had firsthand experience with the data and was therefore familiar with the data even before the actual coding and analysis process started, which can be viewed as a strength.

Finally, because a researcher is interested in discovering the participants' experiences and the complexity of a phenomenon, personal judgment is indispensable in qualitative research (Polit & Beck, 2014, p. 75). Still, critical reflections regarding this were undertaken to reduce personal bias and strengthen the findings' trustworthiness.

6.2.4 Testing the LifeLab learning tasks (Paper IV)

Video recording captures both verbal and non-verbal interaction, making it suitable for capturing social interaction. This was important for us, as we adopted a sociocultural approach when developing the activities. Kristensen (2018) used the onion as a metaphor, describing how video captures different data levels (like the layers of an onion). These were the visible layer, the audible layer, the material layer (the environment), and the emic layer (participant perspectives). This provided us with valuable information to be considered in the analysis, such as facial expressions, student/teacher placement, and body language, among others. Although this was not specifically analyzed, it provided valuable overall impressions.

Also, transcripts of the short sequences are included to illustrate findings. In our study, we used drawings of still frames of the episodes because of data protection purposes. Using both still frames and transcripts of the findings broadens the acknowledgment of the analysis (Derry et al., 2010). The many hours of data emerging from video research require data selection, the process of focusing on specific information, which is relevant to the research question (Derry et al., 2010). These short segments, often called events, are then analyzed (Derry et al., 2010).

A limitation to consider is the possibility of participants not acting naturally around cameras (Bloor & Wood, 2006). Still, most students in our study did not seem to be too affected by the cameras when working with the learning tasks. It was mostly between the activities that some students paid visible attention to them, by looking directly into the cameras or playing around in front of them.

The cameras we used were small and discreet and was not moved around during the class. This might explain why the students seemed to quickly forget about them during class. This is in accordance with the findings by Taar (2017) who had similar experiences using audio recording to collect data.

All FH teachers participating in the FGDs for paper IV were formally qualified FH teachers. They, therefore, do not represent the national average. They may be more confident with respect to the content discussed and raised in the class, which may also impact their feedback after the class. Also, to lessen the burden of FH teachers' already hectic schedule, we let the teachers decide to what degree they wanted to engage during class.

The FGDs which the Ph.D. student had with the students after the testing was conducted without the assistants or FH teachers present. This may have helped reduce social desirability bias, as their presence may have influenced the students into giving more positive evaluations. However, as they knew the facilitator was part of the project, this may still have had an impact on their feedback. Finally, as some students might not want to provide an oral evaluation, all students were provided post-it notes in the colors green, yellow and red. They were then kindly asked to select the color they found representing the class overall (red being bad and green being good), either with a short comment or just the note, and stick the note on the blackboard on their way out from the FGD.

6.3 Ethical considerations

Research ethics protects individuals and minimizes harm (Israel, 2015). Furthermore, although children's voices are important in research, they have the right to protection (Backe-Hansen, 2016; The National Committee for Research Ethics in the Social Sciences and the Humanities, 2019). Therefore, as we collected personally identifiable data through the recording of voices and faces during the recording of the FGDs and the video recording during the testing, all students provided written informed parental consent (Fossheim, 2015) as they were between 11 and 15 years old (Norwegian Centre for Research Data, 2018). The students were also provided a simplified version of the information sheet and provided assent to participate, as participation is voluntary for the child (Norwegian Centre for Research Data, 2018). Also, at the beginning of each

FGD, a brief reminder about anonymity and purpose of the recording was provided. The teachers provided oral consent for the testing of the learning tasks, while providing written consent for the FGDs. Finally, all personally identifiable data material was stored securely during the project under the approval provided by the Norwegian Centre for Research Data.

The Ph.D. student's role as a researcher must also be taken into consideration. With an educational background in nutrition and public health, her predispositions might differ from others, e.g., that of teachers. Therefore, her interest in student's competence building in nutrition and health education in the complex matter might be stronger than others, and she might emphasize its importance to a larger extent. Nevertheless, critical reflection regarding this was undertaken, especially during the analysis of the FGDs, to reduce the effects of personal bias. Furthermore, as she had never worked as a teacher in school nor taught FH herself, she had little prior knowledge of how FH classes are run in schools today. The curriculum and competency aims were what the Ph.D. student familiarized with initially and provided her with an overview and perception of what the students are learning and what the aim of the subject is. Therefore, she had few expectations of and assumptions about the teaching, which might serve as a strength.

Finally, there are some ethical aspects to consider regarding the topics covered in this study. It is important to consider language use and how nutrition and health topics are addressed in FH classes. Careful considerations are needed to avoid victim-blaming (Bunton & MacDonald, 2002, p. 314). Discussing food and health-related topics may give positive attention to the importance of food for health but may also lead to negative attention, which is important to be aware of. By fixating on the "right" or "wrong" items to eat based on calories and nutrients, leaves out important diversities relating to food choice, such as preference, culture or sustainability. Hierarchical approaches to nutrition which only focuses on calories and nutrients is what Hayes-Conroy & Hayes-Conroy (2013) calls "hegemonic nutrition", which they believe is decontextualized. To tackle this issue, we included activities that emphasized several different aspects of food like sustainability, food labelling and critical thinking. Also, the language use relating to the picture-ranking tasks was changed from "healthy" to "nutritious" because the first term was counterproductive to the task's aim of

emphasizing that there is not necessarily a “right” or “wrong” answer to what is “healthy” or not. Therefore, we shifted the focus to “nutritious foods,” focusing on foods that are health promoting which is a more positive perspective. This is in accordance with what adolescent prefer to focus on in regards to food and nutrition education (Stok et al., 2016). Although the activity was not analyzed, this focus was also emphasized during the sugar task.

7 Closing remarks

7.1 Summary of key findings

From our mapping of teaching practice in FH, we found several important findings. Still, the narrow focus on cooking relating activities in FH classes was of particular significance, as the curriculum is comprehensive by covering a breadth of competencies linked to both theory and practice. This mismatch between curriculum guidelines and teaching practices found in Paper III may be regarded as a lost opportunity since both students and teachers value the FH subject as important and relevant. Still, teachers' experience lack of time to be a significant barrier to emphasizing the subject's theoretical aspects to a larger extent. Nonetheless, if the subject shall act as an influential channel for promoting students' health, emphasizing the breadth of competencies in the curriculum is essential.

Our mapping also confirmed that there is a lack of formally qualified teachers in FH. More so, a higher proportion of the qualified teachers were more content and felt they mastered their teaching to a greater extent than the non-qualified teachers which may affect their teaching practices. As many students in Norway receive FH education from teachers not holding a formal competence in the subject, negative impacts on student learning may occur.

From the testing of the developed learning tasks, as the second aim of this thesis, we saw that the activities challenged the students in using their language to solve challenging tasks. Still, when students master this communication skill, it can serve as a powerful tool for learning. It is, therefore, important that students acquire this skill.

7.2 Conclusions

Our findings stress the importance of continued developmental work in FH education. For students to acquire the curriculum's competencies, there needs to be a stronger focus on comprehensive FH education. The students must be provided with the opportunity to work actively with all competencies highlighted in the curriculum. Also, requiring teachers to hold formal FH competence to teach the subject at all levels will increase the subject's status and provide

students with skillful teachers. Together, these could have large individual and societal gains as it would provide a stronger basis for students learning these important life skills outlined in the curriculum.

We have proposed one way to include learning tasks into future FH lessons, which target the curriculum's more theoretical aspects. By focusing on active learning techniques through SCL, students can acquire important learning skills to enhance their learning outcomes.

Although FH is the smallest subject in school, we argue its importance as it deals with fundamental life skills. Therefore, given the challenges seen today, it is time for educators and policymakers to prioritize and strengthen comprehensive FH education so that it can serve as an even more substantial contributor to health promotion among children and adolescents. There seems to be an unexploited potential in FH, necessary to explore.

7.3 Future work

Several points that should be investigated in future research emerged. How and to what degree the FH subject has contributed to, e.g., “giving pupils insight into and the ability to choose and reflect critically on food and meals” (Directorate for Education and Training, 2006, p. 1) would be valuable to explore.

Furthermore, how the new FH curriculum can “contribute to students developing critical thinking, ethical awareness and a sense of responsibility so that they are able to choose food that is both health-promoting and sustainable”(Directorate for Education and Training, 2019b, p. 2) should be investigated in the future to see if the subject fulfills its intentions.

Also, as research indicates that there has been little developmental work in the practical and aesthetical subjects over the years, future research needs to examine how FH’s teaching practices have actually changed over the latest reform and will change after the new curriculums are being implemented this year.

The new FH curriculum focuses more on systematics in food preparation (Directorate for Education and Training, 2020b). At the same time, the focus on recipes is decreased. Although this sounds contradictory, this challenges today's

teaching practice. Therefore, how and to what degree FH teachers free themselves from recipes in future teaching should be investigated. Whether the change in the curriculum will strengthen or weaken comprehensive FH education onwards should also be explored. Finally, how teaching practices differ between qualified and non-qualified FH teachers and how this may impact students learning in FH should be investigated.

Interdisciplinary work with mathematics and science was initially discussed in this project. Therefore, FGDs with teachers in FH, math, and science (in the same focus group) were conducted at all three schools. However, this data is not analyzed due to other data having to be prioritized for this thesis. Therefore, these interviews would be valuable to analyze in future research.

It would also be interesting to explore how data from Paper I, like the use of learning activities, differ between qualified and non-qualified teachers. Also, our FGDs confirmed that time was a barrier to good teaching in FH. Future mapping should, therefore, explore how the different barriers and promoters explored in our survey are, in fact, a barrier in FH education.

We were also only able to analyze some of the learning tasks developed in this project, and only in 6th grade. Therefore, more research is needed to explore all the learning tasks on a larger scale, also in the 9th grade. As we used assistants who were familiar with the learning tasks to lead the classes during the testing, future research should investigate how the FH teachers themselves would manage such learning tasks and how they experience it. This would provide useful insight into how the learning tasks would work for someone unfamiliar with them.

Finally, how the activities tested here could be implemented into FH classes should be explored. In developing such learning tasks, involving FH teacher-students is of special interest, as these are the future FH teachers. The skills they attain during their education will most likely be the ones they bring into their careers. Hence, this might have a significant impact on future FH teaching. Thus, FH teacher-students at UiA are already being introduced to the learning tasks developed in this study during their classes, in the hope they will take them into their careers.

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Appendices

Paper I-IV

Appendix I Ethics approval

Appendix II Questionnaire

Appendix III Topic guides

Appendix IV Information letters and consent forms

Appendix V LifeLab learning tasks

Paper I

The state of learning activities in teaching Home Economics:
A cross sectional study in Norwegian schools

The state of learning activities in teaching Home Economics: A cross sectional study in Norwegian schools

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Abstract

Food and Health (FH) is an important subject in Norwegian schools, but little is known about how this subject is being taught. The aim of this study was to examine the use of exploratory/experimental activities, flipped classroom, activities where students are encouraged to use their senses and digital tools in FH. We further wanted to explore which factors teachers report as barriers and promoters to teaching and learning among students in this subject.

An anonymous online questionnaire was distributed by email to all primary and lower secondary schools in Norway (n=2821), and all FH teachers were invited to participate.

A total of 1170 FH teachers completed the questionnaire, 85% were women. Most teachers (71%) reported using learning activities where students were encouraged to use their senses, followed by exploratory/experimental activities (65%), digital tools (56%) and flipped classroom (14%). Lack of equipment, non-optimal premises and economic factors were most important barriers to good teaching in FH. All teachers highlighted engaged teachers as most important for learning.

Food and health teachers use of the different learning activities investigated in this study varied. Engaged teachers are important for learning, whereas lack of equipment, non-optimal premises and economic factors are barriers to good teaching.

KEYWORDS: FOOD AND HEALTH, HOME ECONOMICS, SCHOOL, TEACHERS, LEARNING ACTIVITIES, NORWAY

Introduction

Major health challenges such as obesity and non-communicable diseases are preventable, and an unbalanced diet is the leading cause of several of these challenges (GBD Risk Factors Collaborators, 2016). Because of this, there is an increased willingness and desire to strengthen the education related to food and health in both Norway, and other countries (Lichtenstein & Ludwig, 2010; Ministry of Health and Care Services, 2013; Slater, 2013).

In Norwegian primary schools (grades 1-7) and lower secondary schools (grades 8-10), Food and Health (FH) is a compulsory subject offered mainly in 6th and 9th grade (Directorate for Education and Training, 2006). FH has evolved from the traditional Home Economics subject, which is the terminology most often used about similar subjects around the world. However, the term FH will be used here onwards since it is specific for the Norwegian school system. The FH subject consists of three main topic areas; Food and lifestyle, Food and culture and Food and consumption, each with its own competence aims (Directorate for Education and Training, 2006). In addition, the five basic skills; oral skills, writing skills, being able to read, numeracy skills and digital literacy are all integrated in the competence aims.

The education in FH aims to contribute in promoting a healthy lifestyle, gain insight and acquire skills in critically choosing and reflecting on food and meals and stimulate the students to prepare food (Directorate for Education and Training, 2006). Despite its important role in a public health

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perspective, FH is the smallest mandatory subject in Norwegian schools with a total of 114 teaching hours in grade 1-7 and 83 teaching hours in grade 8-10 (Directorate for Education and Training, 2006), which constitutes 2.5% of the total teaching hours.

Home Economics courses are taught around the world under different terms, content and focus areas. All the Nordic countries have subjects comparable to FH. The Danish Food Knowledge, the Swedish Home and Consumer Studies and the Finnish Home Economics, are also small in terms of the hours allocated, but have the advantage of being compulsory and share common goal of introducing students to theory and practice relating to cooking. Research regarding this subject is still scarce. Lindblom, Arreman & Hörnell (2013) conducted a national survey of the Swedish Home and Consumer Studies, exploring contextual factors like teacher competence, quality of premises and equipment. They found that 23% of the teachers in Home and Consumer Studies lack formal subject specific qualification and that the quality of premises and equipment varied to a great extent. Veka et al. (2018) observed three FH classes in Norway, and saw that cooking was the most dominating part of the subject. The recipes were central when planning and conducting the teaching and they therefore call the recipes the “hidden curriculum”. Øvrebø (2019) interviewed Norwegian FH teachers and found that economical resources, time and collegial support were important issues related to the realization of the subject. The subject’s timetable set limitations to what they could do as teachers, and practical work relating to cooking was dominant.

Traditionally, FH lessons consist of practical work including cooking (Veka et al., 2018). The teacher introduces the theory in dialogue with the students before or after the practical work, or the theory is given as home assignments (Holthe & Wilhelmsen, 2009). When looking into this structure and comparing it to the aim of the subject (in context with the core curriculum), Holte and Wilhelmsen argue that what seems like a common challenge is to nourish the children’s creative abilities and foster critical thinking. Another challenge described by the same authors is teaching children decision-making processes and motivating them to choose a healthy lifestyle.

Learning activities where the students are performing tasks like discussing or solving problems and reflecting about what they are doing, fosters what is called active learning (Bonwell & Eison, 1991). When investigating Home Economics and food literacy, Pendergast & Dewhurst (2012) argue that students through active learning can come to a deeper understanding of the issues involved and that it can increase their motivation and enthusiasm. Activities like exploratory/experimental activities, sensory tasks, the use of flipped classroom and digital tools can all facilitate active learning.

In a flipped classroom approach, students usually watch short videos or recorded lectures at home before class, and use in-class time afterwards for applying the material through problem solving, peer interaction or other active learning activities (Bergmann & Sams, 2012). The idea is to free time from teaching and lecturing in the class so that the children get more time to work actively with the syllabus they were introduced to at home. Flipped classroom has undergone much research in recent years, especially in higher education (Akçayır & Akçayır, 2018; Baepler et al., 2014; Calimeris & Sauer, 2015; Giannakos et al., 2014; O’Flaherty & Phillips, 2015) and has shown to be a good method regarding students learning performance. Nonetheless, research on the use of flipped classroom approach in FH classes in Norwegian primary and lower secondary school is lacking. It is also uncertain to which extent teachers in FH use digital tools in their teaching. This is relevant to know on the basis of the focus on digitalisation and digital competence seen in schools today (Ministry of Education and Research, 2017; OECD, 2015) and the basic skill related to digital literacy in FH, discussed earlier. Digital literacy can be developed by actively using digital tools in the school setting. Digital literacy occurs at different levels, from being able to use software and technical equipment, to search for literature and be able to interpret and evaluate information from various digital sources critically (Knobel & Lankshear, 2006; Ministry of Education and Research, 2016). Future, renewal and digitization strategy for the primary and secondary education and training (Ministry of Education and Research, 2017) states that one-fourth of Norwegian 9th graders have such poor digital skills that they will have difficulties in school and working life. It might therefore be relevant to include the use of digital tools across all subject, including FH.

In the fall of 2020, the educational reform in Norway, which was introduced in 2006, will undergo a renewal in order to meet the demands of future competence in working life and in society. An important principle for the new curricula will be that the students should be given the opportunity to study the subjects in depth, to see links between disciplines and to develop the ability to reflect and think critically.

To our knowledge, no nation-wide survey with the aim to investigate the use of different learning activities and teachers' opinions regarding learning in FH has been conducted in Norway.

There are several reasons for exploring the use of these four activities in FH. Research has shown that many FH classes is centred around cooking and following recipes, with little emphasis on exploring (Veka et al., 2018). Leer & Wistoft (2018) outlines the importance of using taste education as a resource for learning and that recipes should be viewed as a basis for improvisation, not as a fixed manual. Øvrebø found low levels of nutritional knowledge among students in Norway and suggests to integrate theory and practice more, by using a variety of reaching methods (Øvrebø, 2014). Holthe & Wilhelmsen (2009) also highlights the difficulties in learning the students to choose a healthy lifestyle, in addition to issues with critical thinking and creativity. The increased focus on digitalization in schools (Ministry of Education and Research, 2017) makes it interesting to examine to which extend and why this is used in FH classes. Finally, the focus on deep-learning, which flipped classroom and other active learning tasks like exploratory/experimental activities or sensory tasks can facilitate, is prioritized in the renewal of the school curriculum (Ministry of Education and Research, 2015). It is therefore of interest to investigate this, in order to contribute in development of the subject in the future.

The aim of this study was to examine the frequency of use of the following four different learning activities among FH teachers in Norway; flipped classroom, digital tools, exploratory/experimental activities, and activities where students are encouraged to use their senses. We further wanted to explore the reasons why they were used, and whether there were any learning activities the FH teachers wanted to use more often. Finally, the study aimed to investigate potential factors important for learning in FH and barriers for good teaching in FH.

The study is approved by the Norwegian Centre for Research Data (ref.59097).

Method

The current study is a cross sectional, questionnaire study (Polit & Beck, 2010). In April 2018, a short introductory email containing a link to the project's home page (www.uia.no/lifelab) was distributed to all primary schools and lower secondary schools (n=2821) in Norway. The web page contained the online questionnaire and all necessary information about the study. The headmaster of each school was asked to redistribute this email to their FH teachers, which was the target group for this survey. An invitation to participate in the survey was also published on two Facebook pages relevant for teachers in FH, in addition to a message in the journal published by The Norwegian Association for teachers in FH. Two reminders to answer the questionnaire were sent within five weeks after the initial email distribution and the questionnaire was closed for participants approximately two weeks after the last reminder. In total, 1170 FH teachers completed the questionnaire. FH teachers will onwards in this article be referred to as "teachers".

The questionnaire

The anonymous, online questionnaire was made using SurveyXact 8.2. The teachers gave their consent by answering the questionnaire. The questionnaire contained 25 questions regarding demographics, general structure of the FH subject, learning in FH, learning activities and the need for a renewal of the subject. The questions were developed and pre-tested in collaboration with colleagues at the University of Agder at the Faculty of Health and Sports Science, and with inspiration from a survey conducted by the University of South- Eastern Norway (unpublished data).

This paper presents the findings from 12 of the questions in the questionnaire with focus on the use of different learning activities and factors important for learning.

Participant characteristics

The age categories in the questionnaire were: 18-21, 22-25, 26-30, 31-35, 36-40, 41-45, 46-50, 51-55, 56-60 and >60. These were later merged and recoded into the categories 18-30, 31-40, 41-50, 51-60 and >60 (Table 1). The same was done with the question regarding years of working as a FH teacher. The response alternatives in the questionnaire were: <1 year, 1-5 years, 6-10 years, 11-15 years, 16-20 years, 21-25 years and 26 years or longer, which were also recoded and merged into ≤5 years, 6-10 years and ≥11 years (Table 1).

The question regarding educational background in FH, consisted originally of 11 alternatives in the questionnaire. These were: “general teacher without FH in the portfolio of subjects”, “general teacher with 15 ECTS in FH”, “general teacher with 30 ECTS in FH”, “general teacher with 60 ECTS in FH”, “half unit (30 ECTS) in FH without teacher education”, “year program (60 ECTS) in FH without teacher education”, “Home Economics teacher”, “chef”, “restaurant and food processing (high school)”, “unskilled/assistant” and “other”. Some of the answers in the open-ended “other” alternative were manually moved into one of the other categories based on what was considered appropriate depending on what the teachers wrote (the details can be obtained on request). “General teacher education” was renamed “teacher education” and now includes all the different teacher educational backgrounds. Thereafter, some of the variables were recoded and merged into fewer categories: “general teacher without FH in the portfolio of subjects” was renamed “teacher education without FH competence” and “teacher educated with FH competence” now includes “general teacher with 15 ECTS in FH”, “general teacher with 30 ECTS in FH”, “general teacher with ≥ 60 ECTS in FH” and “Home Economics teacher”. “FH competence without teacher education” now includes “half unit (30 ECTS) in FH without teacher education” and “year program (60 ECTS) in FH without teacher education”. “Chef” and “Restaurant and food processing” were merged into one, the same with “other” and “unskilled/assistant”. Hence, we ended up with five educational categories (Table 1).

Learning activities

Regarding the use of learning activities, the questionnaire focused on the use of flipped classroom, digital tools, exploratory/experimental activities, and activities where students are encouraged to use their senses. Question 1 (Q1) was: “Which of the following learning activities do you use in your FH-teaching? You can select multiple response options” the teachers could select among the four methods described or choose “don’t use any of the methods”. Q2 was: “On average, how often do you use the following learning activities?” response alternatives were: “every FH class”, “1-2 times per month”, “less than once per month”, and “never”. The activities were again presented, and the teachers connected each activity to each of the response alternatives individually (matrix question). Q3 was: “Is there any of these learning activities you would like to use more often? You can select multiple response options”. The teachers could then select among the four learning activities. The last question was: “Why do you use the following learning activities?”. The activities were again presented, and the teachers connected each activity to each of the response alternatives individually (matrix question). The response alternatives were: “the children request it”, “to promote learning among children”, “to promote motivation among children”, “to promote creativity among children”, “for variation”, “to promote cooperation among children” and “other”.

Important factors for learning and teaching in FH

The teachers further responded to a five-point Likert scale to which factors they considered as important barriers to good teaching and promoters of learning in FH. The response options were “very important”, “important”, “do not know”, “not important” and “not important at all” and the categories “important” and “very important” were merged. Regarding barriers, the alternatives were: “lack of equipment”, “non-optimal premises”, “economic factors”, “few hours for the subject”, “collaboration with leaders”, “timetable-issues”, “lack of formally qualified teachers”, “the status of the subject” and “problematic working relations with colleagues” (Table 3). For important factors promoting learning, the alternatives were: “engaged teachers”, “good premises for teaching”, “A lot of practical cooking”, “motivated children”, “combination of practical and theoretical teaching”, “varied teaching methods”, “good economy”, “formally qualified teachers” and “A lot of theoretical teaching” (Table 4). The alternatives (factors) were selected in collaborations with all authors, and particularly with those who had experience working as FH teachers, as they have first-hand experience of which factors would be relevant to examine.

Data analysis

IBM SPSS Statistics 24 was used to analyse the data. Results are presented as frequency with percentages and p-value using descriptive statistics and cross tabulation (Chi-square). Statistical significance was set at $p = \leq .05$. Percentages have been rounded off to whole numbers.

Results

1170 teachers completed the whole questionnaire of whom 85% were women and most were aged 31-40 (Table 1). Some participants only partly completed the questionnaire, and characteristics of those who completely and partly completed the questionnaire are presented in Table 1.

Table 1. Participant characteristics between those who completed the questionnaire ($n = 1170$) and those who partly completed ($n = 222$). LifeLab Food and Health Cross Sectional Study

	Completed		Partly completed		Total		p-value
Gender	n	%	n	%	n	%	
Male	147	79	40	21	187	13	
Female	1023	85	182	15	1205	87	
Total	1170	84	222	16	1392		0.029
	Completed		Partly completed		Total		p-value
Age	n	%	n	%	n	%	
18-30	148	87	22	13	170	12	
31-40	261	91	27	9	288	21	
41-50	346	83	72	17	418	30	
51-60	293	86	48	14	341	25	
>60	122	72	47	28	169	12	
Total	1170	84	216	16	1386		≤.001
	Completed		Partly completed		Total		p-value
Education	n	%	n	%	n	%	
Teacher education with FH competence	512	88	69	12	581	43	
Teacher education without FH competence	409	87	61	13	470	35	
FH competence without teacher education	65	80	16	20	81	6	
Chef or Restaurant and food processing	64	93	5	7	69	5	
Unskilled/assistant/other	120	85	21	15	141	11	
Total	1170	87	172	13	1342		0.17
	Completed		Partly completed		Total		p-value
Years working as FH teacher	n	%	n	%	n	%	
≤5 years	614	89	79	11	693	52	
6-15 years	352	89	43	11	395	30	
≥16 years	204	85	35	15	239	18	
Total	1170	88	157	12	1327		0.321
	Completed		Partly completed		Total		p-value
Time spent on practical cooking	n	%	n	%	n	%	
<30%	17	81	4	19	21	2	
30-50%	32	80	8	20	40	3	
50-70%	163	92	15	8	178	14	
70-80%	361	88	49	12	410	31	
80-90%	380	91	38	9	418	32	
90-100%	217	89	26	11	243	19	
Total	1170	89	140	11	1310		0.16

Cross tabulation and Pearson Chi-square were used to analyse participant characteristics.

Significant level was set at $\leq .05$. The numbers related to "Completed" and "partly completed" is presented to compare the distribution of answers in both groups.

In total, 43% of the teachers were formally qualified FH teachers. Most teachers (52%), had less than five years' experience in teaching FH, and most of them spent around 80% of their time in class on practical cooking. We present findings from the once who completed the questionnaire and the once who partly completed the questionnaire to see if there were any differences between the groups.

We found that there were significantly more women than men who completed the questionnaire ($p=.029$). There were also significantly more teachers in the older age groups who partly completed ($p\leq.001$). We found no difference in experience of working as FH teacher between the two groups ($p=.321$), neither in time spent on practical cooking ($p=.160$), nor in educational background ($p=.170$).

The use of different learning activities

Of the four activities investigated, most teachers (71%) reported using activities where children were encouraged to use their senses when teaching FH (Table 2). This was followed by exploratory/experimental activities (65%), digital tools (56%) and flipped classroom (14%). When asked which of the activities they wanted to use more, most teachers (74%) reported flipped classroom, followed by exploratory/experimental learning methods (71%). The alternative with fewest responses (50%) was to use more digital tools in their teaching.

Table 2. Use of different learning activities (n=1170). LifeLab Food and Health Cross Sectional Study

Learning activities and frequency	Use of learning activities n (%) ^a	Wanting to use more of the activity n (%) [†]
	n = 1170	n = 1170
Exploratory/experimental ^a	762 (65)	834 (71)
Frequency of use ^b		
Every lesson	186 (16)	
1-2 times per month	397 (34)	
Less than once per month	468 (40)	
Never	119 (10)	
Flipped classroom ^a	164 (14)	860 (74)
Frequency of use ^b		
Every lesson	35 (3)	
1-2 times per month	94 (8)	
Less than once per month	627 (54)	
Never	414 (35)	
Use of senses ^a	833 (71)	790 (68)
Frequency of use ^b		
Every lesson	513 (44)	
1-2 times per month	356 (30)	
Less than once per month	230 (20)	
Never	71 (6)	
Digital tools ^a	654 (56)	584 (50)
Frequency of use ^b		
Every lesson	126 (11)	
1-2 times per month	414 (35)	
Less than once per month	528 (45)	
Never	102 (9)	

Descriptive statistics and frequency analyses were used.

^a Answer to question: "Do you use this activity?"

^b Answer to question: "How often do you use this activity?"

[†] Answer to question: "Are there any of these learning activities you would like to use more often?"

Note: since the questions in this table were asked as 3 independent questions, the response rates may vary.

Regarding the use of exploratory/experimental activities and activities where the students are encouraged to use their senses, most teachers highlighted students learning outcome as the most important reason for using them (Figure 1). Most teachers used digital tools and flipped classroom for variation purposes. To promote student motivation and creativity, most teachers reported using activities where students are encouraged to use their senses and exploratory/experimental methods. Very few used any of the methods based upon students request. To promote cooperation, most teachers used exploratory/experimental methods, and flipped classroom. Few teachers used digital tools to promote cooperation or creativity.

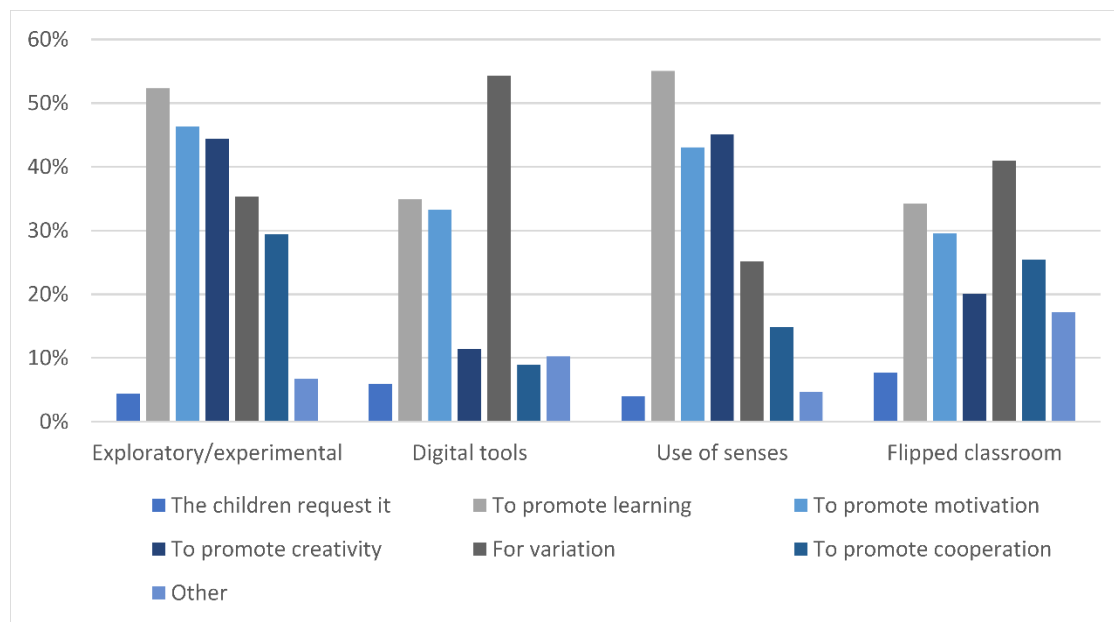


Figure 1. Reasons for using the different learning activities. Percent of answers (n=1170). Teachers were able to select multiple reasons. LifeLab Food and Health Cross Sectional Study

Learning and teaching in FH

Among the factors being barriers to good teaching in FH, lack of equipment, non-optimal premises and economic factors were those mentioned as the three most important factors. Of the suggested factors, problems with colleagues were ranked as least important of the barriers (67%) (Table 3).

Table 3. Proportion of teachers reporting the following as important* barriers to good teaching in Food and Health. N (%) LifeLab Food and Health Cross Sectional Study

Barriers to good teaching	Number (%)
<i>n</i> = 1170	
Lack of equipment	1130 (97)
Non-optimal premises	1125 (96)
Economic factors	1095 (94)
Few hours for the subject	1061 (91)
Collaboration with leaders	1017 (87)
Timetable-issues	984 (84)
Lack of formally qualified teachers	900 (77)
The status of the subject	867 (74)
Problematic working relations with colleagues	782 (67)

*Important: includes the response options “very important” and “important”

Regarding important factors for learning, engaged teachers were important for all participants (Table 4). Furthermore, 99% thought that a lot of practical cooking and having the necessary equipment was important for the promotion of learning in the subject, in addition to motivated students (98%) and good premises for teaching (98%).

Table 4. Proportion of teachers reporting the following as important* factors promoting learning in Food and Health. N (%) LifeLab Food and Health Cross Sectional Study

Factors promoting learning	Number (%)
	Total: 1170
Engaged teachers	1170 (100)
Necessary equipment	1158 (99)
A lot of practical cooking	1157 (99)
Motivated students	1150 (98)
Good premises for teaching	1147 (98)
Combination of practical and theoretical teaching	1108 (95)
Good economy	1099 (94)
Varied learning activities	1092 (93)
Formally qualified teachers	920 (79)
A lot of theoretical teaching	602 (51)

*Important: includes "very important" and "important"

Discussion

To our knowledge, this is the first study in Norway exploring FH teachers' use of different learning activities and what factors they consider influence learning and teaching in the subject.

Of the four learning activities investigated in this study, most teachers use activities where students are encouraged to use their senses (71%). This is not surprising since most of the lesson time is spent on cooking. Furthermore, 44% of the teachers included this in every lesson, indicating that the students are being encouraged to taste, smell or visually examine their food during preparation. However, we do not know how the teachers are working with this, which could be interesting to investigate further.

Few teachers (14%) used a flipped classroom approach in their FH teaching, and since 91% (Table 3) of the teachers found few hours for the subject to be a barrier to learning, applying a flipped classroom approach could be valuable, if they experience lack of time. Students could watch short videos at home on a special food preparation technique, how to prepare a dish or about the nutritional value of different food items, followed by practical work in class. Interestingly, flipped classroom is the method most teachers wanted to use more often which may indicate that they acknowledge flipped classroom as a good way to vary their teaching and to promote learning, which were reported as the two most important reasons for using it. Many teachers also reported that they use flipped classroom to promote student motivation and cooperation which is likely to be the outcome if the teachers also use active learning techniques in class. Furthermore, among the different activities, flipped classroom was the activity most students requested, although not by many.

One of the competence aims for 10th grade is to use digital tools to evaluate energy and nutritional content in food and beverages and make use of this in cooking (Directorate for Education and Training, 2006). Accordingly, all teachers should use digital tools in their teaching during the FH lessons in 9th grade but according to our study, only 56% of the teachers do, and these numbers also includes teachers in 6th grade. As with flipped classroom, most teachers report using digital tools less than once per month (Table 2). The main reason for using digital tools are for variation purposes, but it is not known in what way they use digital tools, which digital tools they use or in what way it promotes variation. The survey conducted by Lindblom et al (2013) also found that the use of computers in Home and Consumer Studies was low and argues that it could be useful to implement

computer use as there are useful webpages that could compensate for the limited access of textbooks in the subject.

As mentioned in the introduction, the aim of FH is to promote insight and skills in critically choosing and reflecting on different types of food and meals (Directorate for Education and Training, 2006). Through the internet, children and adolescents get access to huge amounts of information about what a healthy diet looks like, what is unhealthy, and so forth. It is therefore important that they get taught how to critically appraise all this information, and the FH classes seems like a relevant arena for activities that can foster food literacy (Pendergast & Dewhurst, 2012; Vaitkeviciute et al., 2014; World Health Organization, 2018) cf. the aim of this subject. The curriculum for FH states that using digital tools in FH would make it possible to search for information, compare and evaluate nutritional content and present academic content (Directorate for Education and Training, 2006).

Most teachers (65%) use exploratory/experimental activities in their FH teaching (Table 2), and they use these methods mostly because they believe these methods can promote learning (Figure 1). In the survey, there were no examples of what was meant by exploratory/experimental methods. Therefore, it is possible that the participants interpreted the question differently. Some might consider cooking itself as an exploratory/experimental activity, others might think it is about having a scientific approach to cooking or food items. Experimenting in FH can be understood as working with different experiments regarding smell and taste (sensory tasks), inventing your own products from simple ingredients, or examining what happens with an egg as it is being boiled. The traditional way of organising the FH lectures discussed earlier may inhibit the student's creativity and experimentation in cooking. It is worth noticing that teachers use these activities, and other activities where students are encouraged to use their senses, mostly because they believe it promotes learning. As can be seen in Figure 1, the teachers believe exploratory/experimental activities facilitate cooperation, motivation and creativity to a great degree, which are important elements in deep learning (Fullan et al., 2018). In total, 71% of the teachers also wanted to use more exploratory/experimental methods, indicating that they believe these are good activities regarding student learning outcome. In the school of the future, being able to explore and create is presented as one of four areas of expertise, and critical thinking and problem solving are subsections of this (Ministry of Education and Research, 2015).

Most teachers use approximately 80% of the allocated time on cooking (Table 1). This shows us that the practical cooking part stands strong in this subject, and that it is highly prioritized, supported by the studies conducted by Øvrebø (2019) and Veka et al (2018). This may explain the low frequency use of the various other activities, since parts of the lesson also need to be used to introduce the present meal, instructions, eating, and cleaning up afterwards.

Our study shows that lack of equipment, non-optimal premises and economic factors were the three most frequently reported barriers for good teaching (Table 3). These factors are strongly linked to practical cooking, indicating again that cooking is the most dominating part of the FH subject. Most teachers ticked off that 'few hours for the subject' was a barrier, which also may explain the marginal use of the various activities and the high level of teachers wanting to use more of these methods. Sufficient economical resources and resources like time and collegial support was reported as important factors for realization of the subject among FH teachers interviewed by Øvrebø (2019). These findings are in accordance with our findings related to factors affecting learning and teaching.

All teachers reported 'engaged teachers' as the most important factor for learning (Table 4), which correspond to Lyngsnes & Rismark (2007) who state that teacher knowledge, expectations, creativity and effort is the most crucial determinant of the learning outcome and the experiences the students are left with. This is also supported by Hattie who highlights the importance of what he calls the "expert teachers" (Hattie, 2014, Chapter 3).

The latest hearing from The Norwegian Directorate for Education and Training (2019) regarding the new curricula in FH, highlights several things: more systematics in cooking, a reduced focus on recipes and that the subject will facilitate exploring, using senses and experiencing joy with food and the social part of the meal. Some of these are highly relevant in relation to our findings. Our findings regarding the use of senses and exploring adds to the knowledge of to which extend this is done today, showing that this is something that needs to be emphasized more in the future teaching in FH, if teachers shall meet the upcoming requirements of the subject. The use of a flipped classroom

approach could save time for the teachers on instruction, so the students get more time to work themselves. This would also facilitate an opportunity to include digital tools in their teaching.

Strengths and limitations of the study

The biggest strength of this study is the large number of participants who completed the whole questionnaire (n=1170) and its broad content. The questionnaire was anonymous, short (only 10-15 min response time) and contained only 25 questions. This may have been important factors contributing to the relatively high response rate (45.5% of the recipients completed or partly completed the questionnaire), considering that we did not have direct contact with the teachers. In addition to assess frequency of use of different learning activities, we also investigated the reasons for using them. The questionnaire was piloted among colleagues at the Department of Nutrition and Public Health who had experience with teaching FH in schools.

This study also has limitations. First, not all teachers completed the whole questionnaire. Second, we only investigated four different activities and most response alternatives were closed-ended. In addition, there is always a chance that the teachers misinterpreted the questions and response alternatives (Moy & Murphy, 2016). The teachers were obligated to answer one of the given alternatives before they could move to the next question, although they might have felt it was not completely correct. Some questions should have been limited to those who had responded positively on the previous (for example reasons for using the different activities). The teachers who did not use any of the methods had to select "other" to this question and type in their response to continue the questionnaire. When looking at their responses afterwards, many teachers wrote that they do not use the methods. Because of this, it would be better if the teachers reporting to never use the methods were not given the question about why they use it. Third, the response alternatives in the questions relating to barriers to good teaching and factors important for learning could have been more different to address different aspects more specific to each. The question regarding barriers to good teaching were also not a question asking to rate the importance of the different factors, even though the response alternatives were outlined so. Finally, all questionnaires are prone to errors relating to the memory of the teachers which may affect the accuracy of the responses.

Conclusion

In this paper, we have discussed the use of digital tools, flipped classroom, exploratory/experimental activities and activities where students are encouraged to use their senses in the FH subject. We found that the use of these four activities varied and that sensory tasks were the most frequently used (71%). This was followed by exploratory/experimental activities (65%), digital tools (56%) and flipped classroom (14%). Incorporating and working pedagogically with these activities in teaching FH could be positive both in terms of increased learning outcome and meeting the demands of the upcoming renewal of the subject.

According to the FH teachers, engaged teachers are important for learning, while lack of equipment, non-optimal premises and economic factors were barriers for good teaching. Knowledge about these barriers are valuable in advocating for change with policy makers, both at the school level and nationally. School leaders across the country could benefit from identifying to which extent their teachers experience these barriers, in order to make necessary improvements. In the future, qualitative methods like interviewing FH teachers, could add to the understanding and give a more in depth and holistic picture of the issues investigated here.

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Paper II

Differences in formal education among Norwegian Home
Economics teachers

Differences in formal education among Norwegian Home Economics teachers

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Abstract

Many Norwegian teachers in Food and Health (Home Economics) do not have any formal subject-specific education. This study aims to explore potential differences between teachers with formal versus no formal Food and Health education.

In 2018, Food and Health teachers in all primary and lower secondary schools in Norway were invited to answer a web-based questionnaire.

In total, 1170 Food and Health teachers completed the questionnaire. We found several differences between the groups. Most importantly, 49% of the teachers at secondary school level had formal Food and Health education despite national requirements. Also, a higher proportion of the formally educated group showed more contentment with teaching and reported to a greater extent mastering teaching ($p \leq 0.001$) compared to the non-educated group.

With higher coverage of formally educated teachers in Food and Health, the subject can be strengthened towards fulfilling its potential of being influential for motivation, knowledge and life skills related to food and health.

Key words: home economics, food and health, experiences, education level, teachers, questionnaire, Norway

Introduction

In Norway, compulsory school consists of 10 years for all students, and Home Economics has been a part of the Norwegian school curriculum since 1890 (Askeland et al., 2017). The subject has undergone some changes during previous years, e.g. up until 1959 it was mandatory only for girls, but after that it became mandatory for both genders. In 2006, Home Economics was replaced with the school subject Food and Health (FH). The subject remained mandatory in primary and lower secondary school. FH aims to provide students with the ability to critically reflect on food choices and meals, and develop cooking skills to obtain a health-promoting lifestyle (The Norwegian Directorate for Education and Training, 2006). In 2015, the Ludvigsen committee was appointed by the Norwegian government to address what students need to learn in school in a perspective of 20 to 30 years, i.e. which competences will be important in further education and working life, and how to be responsible members of society (Ludvigsen, 2015). Based on input from the Ludvigsen committee, one of three overarching interdisciplinary topics in the core curriculum (to be applied from 2020) will be *health and life skills* (The Norwegian Directorate for Education and Training, 2019a). Life skills refers to the ability to understand and influence factors that are important for mastering one's own life. The topic *health and life skills* aims to give the students competence which promotes sound physical and mental health and enable them to make good health choices that have great impact on health e.g. lifestyle habits (The Norwegian Directorate for Education and Training, 2019a).

A healthy diet is fundamental for good health. An unhealthy diet is an important preventable risk factor for non-communicable diseases (NCDs), such as cardiovascular diseases, diabetes type II and obesity, well documented by the Global Burden of Disease Study 2017 where Norway is included (Afshin and Collaborators, 2019). Norwegian children have a diet with low intakes of wholegrain, fish, fruits and vegetable (Hansen et al., 2015). According to the new curriculum of 2019 (The Norwegian Directorate for Education and Training, 2019b), the school subject FH in Norway is important in teaching the students how to plan, cook and experience a meal together with their peers according to the dietary guidelines. Further, the subject is important for students to establish an understanding of how food is related to their own health. In a public health perspective large societal gains may be acquired in prevention of NCDs, if the population adhered to dietary guidelines (Sælensminde et al., 2016). Dietary habits develop early and track into adulthood (Scaglioni et al., 2018, Craigie et al., 2011).

Since all children in Norway attend school, FH may contribute fundamentally to the attainment of dietary life skills.

In 2018 there were 2821 primary schools and lower secondary public schools in Norway (according to Statistics Norway), and FH were taught in almost all schools (except a few international schools). Statistics Norway published a report documenting teachers' formal qualification in the subjects they teach, including FH, in primary and lower secondary school. The report showed that FH has the lowest proportion of teachers with 60 ECTS in FH from their teacher training and that 6 out of 10 teachers in FH across primary and lower secondary school do not have any formal education in FH at all (Perlic, 2018/19).

In a report from 2008, Falch and Naper studied how teachers' formal education affects students' achievements in final exams. They found that an increased formal teacher competence (i.e. university degree vs. a lower educational degree) was related to increased academic achievements among students, but found no association between the subject specific formal education and academic achievements (Falch and Naper, 2008). Mathematics and basic reading skills were used as examples of students' academic performance on national tests and final exams in the report (Falch and Naper, 2008) and FH was not a part of this study. International studies have also found that having completed a formal teacher training, is an important factor affecting student achievement (Andersson et al., 2011, Darling-Hammond, 2000). Contrary to the findings of Falch and Naper (2008), other international studies have shown that certified teachers with subject-specific education are important for student achievement (Darling-Hammond, 2000, Darling-Hammond and Youngs, 2002, Blank and de las Alas, 2009, Kunter et al., 2013, Metzler and Woessmann, 2012), and that "student learning should be enhanced by the efforts of teachers who are more knowledgeable in their field and are skilful at teaching it to others" (Darling-Hammond, 2000). The term "pedagogical content knowledge" (PCK), the combination of content knowledge and pedagogical knowledge (Shulman, 1987) is often mentioned in the literature (Förtsch et al., 2016, Fauth et al., 2019, Kunter et al., 2013). A large study on teacher's self-efficacy in 14 OECD countries found, amongst other, that teacher's self-efficacy was strongly linked to student achievement and that experienced teachers had higher self-efficacy (Fackler and Malmberg, 2016). Finally, in addition to self-efficacy, competencies, like showing enthusiasm and being a visible leader may have a positive impact on student achievement (Fauth et al., 2019, Kunter et al., 2013, Nordenbo et al., 2008).

Educating high-quality teachers with subject-specific competences has been an important political initiative in Norway in recent years (Ministry of Education and Research, 2014, Ministry of Education and Research, 2015). As a result, in some subjects, 30 ESCTs are now required to teach a subject at the primary school level and 60 ECTS are required at the lower secondary school level (The Norwegian Directorate for Education and Training, 2015). The requirements for teaching FH in lower secondary schools consist of at least 30 ECTS (i.e. formal FH education) as part of the teacher training (The Norwegian Directorate for Education and Training, 2015). These requirements only apply to teachers with a permanent position, hired after January 1st, 2014. In primary schools, there are no requirements for a subject-specific education in FH. Consequently, a newly published report assessing policy and efforts regarding healthy food environments in Norway suggests specifically to require teachers to have subject-specific education to teach FH as a means to strengthen nutrition work in the public sectors (Torheim et al., 2020). This acknowledges the importance of qualified teachers in order to serve as a health-promoting subject. Food and Health is a complex subject to teach and some teachers are not aware of their lack of subject specific competence themselves (Ask et al., 2020).

The ethical aspects in food and health are important to consider as it addresses the students' own health. Careful considerations are needed to avoid students feeling blame for an unhealthy diet or lack of food knowledge. The topic may give positive attention to the importance of food and health but may also lead to negative attention, e.g. eating disorders which are important to be aware of.

In order to understand how the subject FH can be strengthened to fulfil its potential of being an influential channel for motivation, knowledge and skills related to food and health, more knowledge is needed concerning the educational level among teachers in FH; to which degree FH teachers feel that they master their work, whether and to which degree they are content with teaching FH, and how satisfied they are with how the subject is taught in schools today. The aim of this study was to explore potential differences between teachers with formal versus no formal subject-specific Food and Health education regarding school level, gender, age, length of experience in teaching, contentment and feeling of mastering teaching Food and Health, and whether they include basic skills, and seeing potential needs for a renewal of Food and Health in Norway.

Methods

This present study is a part of a wider project called LifeLab Food and Health. The design was cross-sectional, and the data was collected between April and May in 2018. Prior to this, a short email containing an introduction to the project and a link to the project's home page (www.uia.no/lifelab) was distributed to the head teachers at all primary schools and lower secondary schools in Norway (n=2821). The web page contained an anonymous online questionnaire and the details about the study. The head teacher at each school was asked to redistribute the email to their FH teachers, being the target group for the study. An invitation to participate in the survey was also published on two Facebook pages relevant for teachers in FH, in addition to an advertisement in the journal published by The Norwegian Association for teachers in Food and Health. The anonymous, web-based questionnaire was made using SurveyXact 8.2 and contained some items from a previously used questionnaire (Bottolfs, 2020). The FH teachers gave their consent by answering the questionnaire. Two reminders were sent within five weeks after the initial email distribution. The questionnaire was closed for participants approximately two weeks after the last reminder. The LifeLab Food and Health project was approved by the Norwegian Centre for Research Data (ref.59097), and the Ethical committee of Faculty of Health and Sport Sciences at the University of Agder.

Measures

The questionnaire contained 25 items covering demographics, structure of the FH subject, contentment of teaching in FH and seeing potential needs for a renewal of FH. The items were developed in collaboration with colleagues at (name of institution removed for blind review).

The survey was pilot tested among colleagues with experience working as FH teachers.

Age were measured by "What is your age" and the response categories were: *18-21, 22-25, 26-30, 31-35, 36-40, 41-45, 46-50, 51-55, 56-60 and >60*. These were merged and recoded into the categories *18-30, 31-40, 41-50, 51-60 and >60* (table 1). Length of experience as a FH teacher was measured as "How many years have you worked as a FH teacher (including home-economics)?" The response categories were: *<1 year, 1-5 years, 6-10 years, 11-15 years, 16-20 years, 21-25 years and 26 years or longer*. These categories were merged into *0-5 years, 6-15 years and ≥15 years* (table 1).

Formal subject specific education in FH were measured by "what is your educational level in FH? The 11 response categories were *"1=general teacher without formal training in FH", "2=general teacher with 15 European Credit Transfer and Accumulation System (ECTS) in FH", "3=general teacher with 30 ECTS in FH", "4=general teacher with 60 ECTS in FH",*

"5=30 ECTS in FH without general teacher education", "6=60 ECTS in FH without general teacher education", "7=Home Economics teacher (old title)", "8=chef", "9=restaurant and food processing (from upper secondary school)", "10=unskilled/assistant" and "11=other".

Some of the answers in the open-ended "other" alternative were manually moved into one of the other categories based on what was considered appropriate. The FH education variable was recoded into a dichotomized variable denoting teachers with formal FH education (response category 2,3,4,7; n=512) and teachers without formal FH education (response category 1,5,6,8,9,10,11; n=658). School levels of teaching were measured by "which level do you teach FH"? Response categories were from grade 1 to grade 10, and they were merged into two categories: teaching at primary school level (grades 1-7, n=615) and secondary school level (grades 8-10, n=555).

Contentment as a FH teacher and extent of mastering the subject

Contentment as a FH teacher was measured by "How content do you feel with teaching FH?", and the response categories were: *Very content, content, neither content nor not content, little content and very little content*. They were merged into three categories: Very content/content, neither content nor not content, little content/very little content. Mastering the task of teaching FH were measured by "To what extent do you feel that you master teaching in FH?". The response categories were: *very large extent, large extent, to some extent, to little extent, very little extent*. Responses were merged into two categories: Very large/large extent and to some/little/very little extent.

Teachers views on content of Food and Health

Teachers were asked about how they include basic skills in their teaching by: "To what extent do you include the five basic skills (oral, writing, reading, mathematics, use of digital skills) in your FH teaching?" Use of dietary guidelines in FH class were measured by "To what extent do you follow the dietary guidelines when deciding what food to make in FH class?" The response categories for both items were: *very large extent, large extent, to some extent, to little extent, very little extent*. Response categories were merged into 2 categories: Very large/large extent and to some extent/little/very little. Relevance to the society was measured by: "To what extent do you feel that food and health is viewed as relevant for the society?" Attitudes regarding diet and health were measured by: "To what extent do you feel that teaching FH fosters positive attitudes towards diet and health?" Being a resource person for the students were measured by: "To what extent do you regard FH teachers as a resource in prevention and health promotion among students?" The response categories for these three

items were: *very large extent, large extent, don't know, to little extent, not at all*. Response categories were merged into three categories: Very large/large extent, don't know, to little extent/not at all. Regarding a potential need for renewal of FH in Norwegian schools, the teachers were asked: "Do you feel a need for a renewal of FH?" The response alternatives were: *No, it works fine as it is* or *yes, it's time for a renewal*.

Statistics

All data were analysed using the IBM SPSS statistical software package version 25.0. For all tests, $P \leq 0.05$ was considered significant. Descriptive statistics with frequencies in percentages were used. Cross tabulation (Chi-square tests) were used to test differences between groups.

Results

An overview of the proportions of different educational levels among FH teachers in Norway is presented in table 1. In total, 1170 FH teachers completed the questionnaire of whom 43.8% had formal FH education (EDU group) ($n=512$) and 56.2% had no formal FH education (no EDU group) ($n=658$) (table 2). Among the teachers teaching at secondary school level ($n=555$), grade 8-10, 48.6% had a formal FH education (data not shown). A higher proportion of the EDU group taught at lower secondary school level compared to the no EDU group ($p \leq 0.001$). There were more women than men ($>85\%$) in the total sample, but there were no gender differences between the EDU group and the no EDU group (table 2). In this data, a higher proportion of the EDU group was younger ($p \leq 0.001$) and had more years of experience teaching FH compared to the no EDU group ($p \leq 0.001$) (table 2). Likewise, a higher proportion of the EDU group showed contentment with teaching FH ($p \leq 0.001$) and reported to a larger extent to master the teaching of FH compared to the no EDU group ($p \leq 0.001$) (table 2). A higher proportion of the EDU group reported including the basic skill of writing in FH classes compared to the no EDU group ($p=0.02$) (table 3). A higher proportion of the EDU group was in favour of a renewal of the subject while a higher proportion of the no EDU group reported that the subject works fine as it is ($p=0.01$) (table 3).

Discussion

According to our findings, 44% of the teachers in the total sample engaged in teaching FH had formal FH education. Further, when only looking at teachers teaching FH in lower secondary school, 49% of the teachers were formally qualified. Teachers with formal FH

education were younger and had longer experience teaching the subject than the no EDU group (teachers without formal FH education). In the EDU group, more teachers felt they mastered their job and felt more content with teaching FH than in the no EDU group. More teachers in the EDU group reported including writing as a basic skill compared to the no EDU group and more teachers in the EDU group were in favour of a renewal of the subject compared to the no EDU group. These results were for the total sample, regardless national requirements of formal education in Food and Health.

Given that the requirements for formal education (ECTS in FH) only apply to lower secondary school and for teachers hired after January 1st, 2014, it is not surprising that a higher proportion of teachers in the EDU group teaches at lower secondary school level. The new requirements for formal education in FH from 2014 may explain why there were only half of the teachers that complied with 30 ECTS and why there were a higher proportion of younger teachers in the EDU group. This contrasts with the most recent report from Statistics Norway which found that a higher proportion of older teachers had formal education in FH compared to their younger colleagues (StatisticsNorway, 2019). FH has the largest proportion of teachers without subject-specific education across all subjects (StatisticsNorway, 2019). Because the practical aesthetical subjects like FH have no requirements to formal education in primary school and a lower requirement (30 ESCT) in lower secondary school compared to some other subjects, this may create a gap in the quality of teaching between these subjects, and maybe more importantly, the learning outcome among the students. FH aims to provide students with the ability to critically reflect on food choices and meals in order to adhere to health-promoting lifestyle (The Norwegian Directorate for Education and Training, 2006). Given the importance of teachers subject specific education on student achievement discussed initially e.g. (Kunter et al., 2013, Blank and de las Alas, 2009, Metzler and Woessmann, 2012) such in-depth and complex issues should be taught by well qualified teachers, as highlighted by (Darling-Hammond, 2000). From 2020, a master's specialization in FH as part of teacher training will be offered in Norway. This may contribute to a higher number of educated teachers in FH and further increase the status of the subject.

A higher proportion of teachers with formal FH education had longer experience teaching the subject than the no EDU group, indicating that the EDU group to a greater extent continue teaching FH when they first get assigned to teaching it. A higher proportion of teachers in the EDU group felt they mastered their job compared to the no EDU group in addition to feeling

more content with teaching. The difference between the groups might be explained by the importance of having subject-specific competence in order to increase teacher self-efficacy (Nordenbo et al., 2008). As discussed initially, a higher level of self-efficacy might also support student achievement (Fackler and Malmberg, 2016). Although there was a significant difference between the two groups, both groups reported high levels of contentment in teaching FH and to master their teaching in FH (around 90%). It is likely to assume that teaching a subject one has no specialization in, may make you feel more insecure and less content. Similar findings are reported in the school subject survey conducted in 2013 (Espeland et al., 2013) p. 109.. They also found both educated and non-educated FH teachers rating their competence as high, despite the majority lacking FH education. The authors therefore wonder if the teachers draw on their own experiences when evaluating their competence, as being an experienced cook at home equals being a qualified FH teacher.

A higher proportion of teachers in the EDU group included to a greater extent the basic skill of writing in their FH teaching compared to the no EDU group. Basic skills like reading and writing, being able to express yourself orally, mathematics and the use of digital skills are meant to be incorporated into the competence aims in all subjects in school, and this study shows that the amount of emphasis vary between the two groups. According to the curricula, examples of writing skills in FH can be to describe taste, smell and aesthetics, written work, or to write down own recipes and methods related to the practical work (The Norwegian Directorate for Education and Training, 2006). The other four basic skills (oral, reading, mathematics, digital skills) were all included to a large extent in FH teaching, but we did not find any differences between the two groups.

Although a fairly high number of teachers in both groups felt it is time that the FH subject need to be renewed, a higher proportion of FH teachers in the EDU group expressed this to a larger extent. Teachers who have studied FH in their teacher training might see challenges and opportunities to a greater extent, than the no EDU group.

Strengths and limitations

There are some limitations to be considered. This study was based on self-reported data relying on memory which can introduce response bias. Further, the results may be affected by social desirability bias and misinterpretations (Moy and Murphy, 2016). Also, a survey will

not explore any phenomenon in depth, which may leave out interesting and valuable aspects. The questions and answers were to a large degree fixed, which may omit important information since the respondent cannot answer freely. Since the survey was anonymous, we do not know if the response rate reflects the number of schools approached in the recruitment process (n=2821) nor if it reflects the entire population of FH teachers in Norway. We also do not know if the spread of the data is associated with geography, and these represent limitations. As the email was sent to all schools in Norway, we think there are reasons to assume a fairly equal geographical spread of the data, but the results should be interpreted with caution. Concerning bias in the response rate and which teachers actually responded, it is likely that the teachers interested in the topics raised in the questionnaire responded, while the teachers that did not have any interest in these matters did not respond, introducing a bias that may influence the validity of our results. If this assumption holds, teachers with formal education in Food and Health may be overrepresented in the study, and the “true” proportion of formally qualified FH teachers may be even lower than what we report.

Finally, the research design is cross-sectional, and causal relations cannot be drawn.

There are also strengths to the present study. Given the large sample of participating teachers (n=1170), this is to our knowledge the largest nationwide survey among teachers in FH in Norway. This may be a sign that teachers find it important to contribute to research in this subject in general, as research on the subject is still limited. This survey is to date the only one which has explored the various aspects examined here, except qualification which Statistics Norway regularly assesses. The survey was also pilot tested among colleagues with work experience as FH teachers. The anonymous and self-administered nature of the survey may reduce the presence of social desirability bias (Bryman, 2016). Other advantages of web-based questionnaires compared to paper-based questionnaires include low cost of administering and, less time-consuming analysis process, as responses can be directly transferred into analysis software (Bryman, 2016). Finally, participants were able to answer at any electronic device (smart phone, tablet, or computer), at any time which may suit them.

Conclusions

Our findings revealed that about half of the teachers in lower secondary school had formal FH education, despite national requirements of having at least 30 ECTS in FH.

We also found that teachers with formal education in FH were more content and reported to master their teaching to a larger extent than those with no formal FH education. FH is an

important subject in school as it relates to both current health and future health of children and adolescents. A stronger emphasis on quality teaching from well-trained teachers should therefore be of interest, as the subject is important in a public health perspective.

With an ongoing focus on increasing teacher competence and a new master's degree in FH being offered at universities in Norway from 2020, the number of educated teachers in FH may increase in the future. With higher coverage of formally qualified teachers, the subject food and health can be strengthened and thus more likely be able to fulfil its potential of being an influential channel for motivation, knowledge and skills related to food and health among children and adolescents in Norway.

Based on the findings from this survey, we propose further research to explore teacher competence regarding FH in Norway. Special emphasis should be placed on their subject specific competence in FH and how this might affect student achievements and competency aims outlined in the curriculum.

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Table 1 Food and Health teachers' education level and level of teaching. In total: 1170 participants

	n	%
Teacher education without Food and Health competence	409	35.0
Teacher education with Food and Health competence 30 ECTS in Food and Health (1/2 year)	208	17.8
Teacher education with Food and Health competence 60 ECTS in Food and Health (one year)	198	16.9
Teacher education with Food and Health competence 15 ECTS in Food and Health (1/4 year)	90	7.7
Other	65	5.6
Food and Health competence (60 ECTS) without general teacher education	56	4.8
Unskilled/Assistant	55	4.7
Chef	41	3.5
Restaurant and food processing (upper secondary school level)	23	2.0
Home economics teacher (old title)	16	1.4
Food and Health competence (30 ECTS) without general teacher education	9	0.8
Teaching primary school level (grade 1-7)	615	52.6
Teaching lower secondary school level (grade 8-10)	555	47.4

Descriptive statistics, frequencies

Table 2 Food and Health teacher’s school level, gender, age, experience in teaching, contentment and mastering the job according to formal education level. In total: 1170 participants

	Teachers with formal Food and Health education (EDU group) n (%) n=512, 43.8%	Teachers without formal Food and Health education (no EDU group) n (%) n=658, 56.2%	p-value
Teaching grade			
Primary school (grade 1-7)	242 (47.3)	373 (56.7)	
Lower secondary school (grade 8-10)	270 (52.7)	285 (43.3)	≤0.001
Age			
18-30	84 (16.4)	64 (9.7)	
31-40	119 (23.2)	142 (21.6)	
41-50	138 (27.0)	208 (31.6)	
51-60	131 (25.6)	162 (24.6)	
>60	40 (7.8)	82 (12.5)	≤0.001
Gender			
Women	452 (88.3)	571 (86.8)	
Men	60 (11.7)	87 (13.2)	0.44
Experience in teaching Food and Health			
0-5 years	213 (41.6)	401 (60.9)	
6-15 years	181 (35.4)	171 (26.0)	
>15 years	118 (23.0)	86 (13.1)	≤0.001
Contentment with teaching Food and Health			

Very content/content	498 (97.3)	602 (91.5)	
Neither content/nor not content	12 (2.3)	42 (6.4)	
Little content/very little content	2 (0.4)	14 (2.1)	
			≤0.001
Feeling of mastering teaching			
Food and Health			
Very large/large extent	495 (96.9)	583 (89.3)	
To some extent/little/very little	16 (3.1)	70 (10.7)	
			≤0.001

*Chi-square test was used to test differences between the two educational groups

Significant p-values in bold.

Table 3 Food and Health teacher's questionnaire responses according to having formal FH education or not. In total: 1170 participants

	Teachers with formal Food and Health education n=512, 43.8% n (%)	Teachers without formal Food and Health education n=658, 56.2% n (%)	p-value*
Use of dietary guidelines in teaching			
Very large/large extent	339 (66.2)	401 (60.9)	0.06
To some extent/little/very little	173 (33.8)	257 (39.1)	
Ability to positively influence students' attitude towards food and health			
Very large/large extent	430 (84.0)	540 (82.1)	0.66
Don't know	64 (12.5)	90 (13.7)	
To little extent/not at all	18 (3.5)	28 (4.3)	
FH teachers being a resource person in health promotion among students			
Very large/large extent	451 (88.1)	551 (83.7)	0.11
Don't know	46 (9.0)	82 (12.5)	
To little extent/not all al	15 (2.9)	25 (3.8)	
Use of Skills, oral			
Very large/large/some extent	504 (98.4)	641 (97.4)	0.23
little/to very little extent	8 (1.6)	17 (2.6)	
Use of Skills, writing			
Very large/large/some extent	432 (84.4)	520 (79.0)	0.02
little/to very little extent	80 (15.6)	138 (21.0)	

Use of Skills, reading			
Very large/large/some extent	509 (99.4)	651 (98.9)	
little/to very little extent	3 (0.6)	7 (1.1)	
			0.38
Use of Skills, mathematics			
Very large/large/some extent	505 (98.6)	651 (98.9)	
little/to very little extent	7 (1.4)	7 (1.1)	
			0.64
Use of Skills, digital skills			
Very large/large/some extent	505 (98.6)	651 (98.9)	
little/to very little extent	7 (1.4)	7 (1.1)	
			0.64
Experience of the FH subject having relevance to the society			
Very large/large extent	338 (66.0)	466 (70.8)	
Don't know	47 (9.2)	60 (9.1)	
To little extent/not at all	127 (24.8)	132 (20.1)	
			0.14
Need for renewal of Food and Health in schools			
No, it works fine as it is	265 (51.8)	390 (59.3)	
Yes, it's time for a renewal	247 (48.2)	268 (40.7)	
			0.01

*Chi-square test was used to test differences between the two educational groups
Significant p-values in bold.

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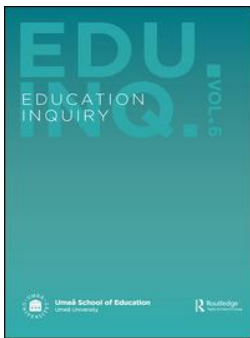
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Paper III

The mismatch between teaching practices and curriculum goals in Norwegian Home Economics classes: a missed opportunity



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Cecilie Beinert , Päivi Palojoki , Gun Åbacka , Polly Hardy-Johnson , Dagrun Engeset , Elisabet Rudjord Hillesund , Anne Merete Selvik Ask , Nina Cecilie Øverby & Frøydis Nordgård Vik

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The mismatch between teaching practices and curriculum goals in Norwegian Home Economics classes: a missed opportunity

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ABSTRACT

Current curriculum guidelines emphasise the importance of both nutrition education and the development of practical cooking skills in the school subject Food and Health (FH). This study aimed to explore teachers' and students' perspectives and experiences of current classroom practices in FH. Focus group discussions (FGDs) with teachers and students at three schools in Southern Norway were conducted and thematically analysed. Our findings suggest there is a mismatch between curriculum guidelines and teaching practices. Although teachers understood the benefits of nutrition education, practical cooking activities were prioritised. Three key themes were identified; *students and teachers value cooking* and *limited time*, which both explain this mismatch from the perspectives of students and teachers, and *pedagogical solutions to resolve the mismatch*, which summarises novel learning activities suggested by students and teachers as a solution for this mismatch. There needs to be a focus on comprehensive nutrition education in FH classes, to improve its pedagogical implications and meet the demands of the curriculum. These findings can be used to inform educators and policymakers on how to strengthen nutrition education in FH.

KEYWORDS

Food and Health; Home Economics; classroom practices; experiences; nutrition education; cooking; students; teachers

Introduction

Many of today's health challenges related to non-communicable diseases (NCDs) are strongly linked to poor nutrition (Afshin et al., 2019; Institute of Public Health, 2016). Although research has shown that the diet of children and adolescents in Norway is largely in line with the recommendations of the health authorities, it still contains too much added sugar and saturated fat, and not enough fruit, vegetables and fish (Hansen Brooke, Myhre Borch, Johannesen Wetting, Paulsen Mohn, & Andersen Frost, 2017).

The Norwegian school subject Food and Health (FH), internationally known as Home Economics (HE), provides an ideal opportunity for a society to invest in child and adolescent diet and health (Lichtenstein & Ludwig, 2010). HE is an umbrella term

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which encompasses several disciplines, situated in the human sciences (Dewhurst & Pendergast, 2008; International Federation for Home Economics, n.d.). HE is taught around the world under different structures, names, and content, but with the commonality that they involve food education (McCloat & Caraher, 2020). In countries like Malta, Republic of Ireland and State of Victoria Australia, HE is an optional subject. The Nordic countries Denmark, Sweden and Finland have subjects similar to the Norwegian FH subject in that they are small, but self-standing compulsory subjects consisting of practical cooking practice and theory relating to sustainability, food, and nutrition (Ministry of Children and Education, 2019; Tuomisto, Haapaniemi, & Fooladi, 2017). Research has shown that HE can influence food knowledge that is sustained into adulthood (Worsley, Wang, Yeatman, Byrne, & Wijayarathne, 2015), and that nutrition knowledge and food literacy, may influence dietary intake, especially fruit and vegetable consumption (Spronk, Kullen, Burdon, & O'Connor, 2014; Vaitkeviciute, Ball, & Harris, 2014; Wardle, Parmenter, & Waller, 2000; Worsley, 2002).

There is a one-hundred-year long tradition of teaching HE in Norway (Askeland, Skjelbred, Aamotsbakken, & Maagerø, 2017). Through the Knowledge Promotion Reform (Ministry of Education and Research, 2006) which was introduced in 2006, the HE curriculum was renewed and renamed FH. The subject consists of three main subject areas: *food and lifestyle*, relating to the connections between diet and health, *food and consumption*, which addresses e.g. food production and environmental matters, and *food and culture*, which covers Norwegian and foreign food cultures (Directorate for Education and Training, 2006). Broadly, the objectives of FH is to help students acquire the ability to choose and reflect critically on food and meals, and help students become aware of what promotes good health (Directorate for Education and Training, 2006). Despite its ambitious curriculum, FH is the smallest of the mandatory subjects in Norwegian schools, consisting of 197 teaching hours through primary and lower secondary school (Directorate for Education and Training, 2018). In comparison to the other three mandatory practical and aesthetical subjects, which FH also is categorised as, there are 368 hours allocated to music, 623 hours of arts and crafts, and 701 hours of physical education (Directorate for Education and Training, 2018). FH classes are usually taught in the 6th and 9th grade and situated in classrooms with kitchen facilities. It is up to the individual school how they carry out the teaching in different subjects and make sure that the students reach the competency aim in each subject (Ministry of Education and Research, 2006). Therefore, the teaching may vary between schools. In order to teach FH in primary school level (grades 1–7), there are no requirements for having any formal qualification in FH (Ministry of Education and Research, 2014). At lower secondary school level (grades 8–10), there is only a requirement of having 30 ECTS in FH from the teacher education, if the teacher is hired in a permanent position after 1st January, 2014 (Ministry of Education and Research, 2014). As a result, six out of ten FH teachers lack formal education in the subject at primary and lower secondary school level, which is the highest number among all subjects (Perlic, 2019).

In 2020, there will be a renewal of the entire Norwegian school curricula. The topic *Health and life skills* will be one of three interdisciplinary topics to be included across all school subjects (Directorate for Education and Training, 2019a), placing health education on the national agenda. The Ministry of Education and Research (2016, p. 34)

states that all school subjects need to have clearer priorities to facilitate in-depth learning. In FH, the theoretical issues related to food choice, diet and health should be connected to the daily practical work in classrooms for the students to see connections between theory and practice (Ministry of Education and Research, 2019, p. 21).

From 1st of August 2020, the new curriculum in FH will apply. In the new curriculum, FH is described as a key subject in developing an understanding of the connections between diet and health (Directorate for Education and Training, 2019b). Further, there are fewer competence aims compared to the old curricula, which is in accordance with the proposal to reduce the scope and facilitate in-depth learning in subjects (Ministry of Education and Research, 2016, p. 34; 2019, p. 23).

Given that the Norwegian FH curricula highlight the importance of educating students about the connections between diet and health, i.e. nutrition education, it is crucial that learning activities being utilised effectively facilitate student learning. Students must be active and participate in classroom activities in order to learn (Ministry of Education and Research, 2016, p. 39). Active learning is described as instructional activities that allow students to participate in the learning activities, exceeding the notion of merely being a passive listener and note-taker (Gogus, 2012). The core curriculum (Directorate for Education and Training, 2019a, p. 10) states that teachers must encourage e.g. communication and collaboration among the students, skills which are emphasised as important in social learning and development. Within a sociocultural approach to learning, these skills can themselves be viewed as a pedagogical approach to learning, as the emphasis lies on “the interdependence of social and individual processes in the construction of knowledge” (John-Steiner & Mahn, 1996, p. 191). Social interaction among the students is thus a key component of high-quality learning, and language is viewed as an important tool for interacting, understanding key-concepts and enhancing the learning process as a whole (Mercer, 2013, p. 153; Vygotsky, 1978).

Although there is limited research on FH in Norway, recently published literature indicates that the teaching in FH today mainly consists of cooking (Beinert et al., 2020; Veka, Wergedahl, & Holthe, 2018) and thereby learning the practical skills related to cooking and hygiene. For children and adolescents to be able to make healthy choices and reflect around food and meals, as described in the curriculum (Directorate for Education and Training, 2006), it is beneficial to learn both the practical skills of “how” and interpretive and deep learning of “why”, as discussed by Pendergast and Dewhurst (2012, p. 257) regarding Home Economics and food literacy. Food literacy can be defined as:

The scaffolding that empowers individuals, households, communities or nations to protect diet quality through change and strengthen dietary resilience over time. It is composed of a collection of inter-related knowledge, skills and behaviours required to plan, manage, select, prepare and eat food to meet needs and determine intake. (Vidgen & Gallegos, 2014, p. 5)

Recently, researchers have begun to develop a tool to measure child food literacy (Amin, Lehnerd, Cash, Economos, & Sacheck, 2019). They found knowledge of food systems, cooking, and nutrition, cooking skills and self-efficacy regarding eating to be important food literacy domains. A recent systematic review found self-efficacy and knowledge to modify socioeconomic differences in dietary behaviour among youths (Mekonnen et al., 2020). Also, according to an Australian study (Ronto, Ball, Pendergast, & Harris, 2016), adolescents ranked food and nutrition knowledge to be the most important aspect impacting

their dietary behaviour. However, most adolescents did not apply their knowledge, due to lack of food skills. Hence, the authors suggest educators should focus more on how to apply food and nutrition knowledge. Comprehensive nutrition education in FH classes is therefore an ideal way of increasing food and nutrition competence among children and adolescents.

This current study is part of a wider project called “LifeLab Food and Health – innovative teaching for the school of the future“. LifeLab aims to develop and evaluate various student active learning tasks for FH, focusing on nutrition education to increase students’ knowledge and skills regarding the association between diet and health. This study aimed to explore teachers’ and students’ perspectives and experiences of current classroom practices in the school subject FH, and to use these experiences and insights in the development of the student active learning tasks. We used focus group discussions (FGDs) because our “concern is understanding the phenomenon of interest from the participant’s perspective” (Merriam, 2009, p. 14).

Methods

Participants

Three schools were conveniently selected (Battaglia, 2013), based on their role as collaborating schools for the teacher training education at the University of Agder. Three schools were chosen to widen the pool of potential participants in case one or two schools withdraw or would not participate. An email was sent to the principals of each school asking for the opportunity for the project researchers to visit and inform them about the project and their potential participation. All the three schools responded positively and agreed to participate. Teachers in FH were included in the study independent of educational background, as their experiences in teaching the subject was what the researchers wanted to explore.

Data collection

Data collection was carried out between June and September in 2018 and consisted of FGDs with FH teachers and students (separately). All FGDs were conducted in a private room at the participating schools during the school day. All three schools had FH classes at 6th and 9th grade. Therefore, the student FGDs were held in September among those who had recently finished their year of FH (7th and 10th graders, aged 12 and 15) or in June among those who were at the end of their year of having FH (6th and 9th graders, aged 11 and 14). The size of the FGDs depended on the availability of participants and was guided by the recommended 5–8 participants per group (Krueger, 2015). Also, one individual interview with a FH teacher was conducted since only one teacher was available from this particular school. This interview and FGD data were pooled and analysed together.

A total of nine FGDs at two combined primary and lower secondary schools (schools consisting of both primary school and lower secondary school, school, 1 and 2) and one primary school (school 3) in Southern Norway were conducted (Table 1).

The FGD semi-structured topic guide for students was piloted (Merriam, 2009, p. 95) with students of a similar age group (10–14 years) and modified based on feedback. Specifically, the younger adolescents felt that the language used was not

Table 1. Overview of the student and teacher Food and Health interviews conducted, the LifeLab Food and Health project.

	School 1	School 2	School 3	N
Students				
Grade	6th	7th	7th	7th
Girls	4	3	3	2
Boys	3	2	2	1
Total	7	5	5	3
Duration of FGDs (min)	40	30	22	—*
Teachers				
Female	0	4	2	6
Male	1	0	1	2
Total	1	4	3	8
Duration of FGDs (min)	31	42	35	
Teacher experience and background information	60 ECTS in FH. Teaches usually 9th grade FH, but has no classes this year	Teacher 1: 0 ECTS in FH. Has taught 6th grade FH for two years, and 9th grade for one year. Currently assigned two groups of FH classes	Teacher 1: 2nd grade teacher with 60ECTS in FH Teacher 2: Newly educated with 30 ECTS in FH. Will have FH in 6th grade onwards Teacher 3: 30 ECTS in FH. Teaches FH in 6th grade	
		Teacher 2: 60 ECTS in FH. Has had two FH groups in 6th grade, but currently none.		
		Teacher 3: 30 ECTS in FH. Has currently, and for the first time, one group of 6th grade FH.		
		Teacher 4: 60ECTS in FH. Has taught FH for seven years, teaches currently only one group.		

* The recording of this FGD had to be deleted after it had been transcribed, and the duration was not noted prior to this.

understandable, and so this was modified to simplify it. The teacher FGD guides were pilot tested on two colleagues who had previously taught FH.

Topics covered in the FGDs to respond to the research aim of this study included how teachers and students experienced the subject in general, how a typical FH lesson was carried out, preferred learning methods and what elements they personally believed was important to achieve a good learning outcome in any given subject. The questions concerning preferred learning methods were directed towards learning in general. Further, in the teacher FGDs, possibilities, and barriers for implementing novel learning tasks were explored, as this was regarded crucial at a later stage, when the developed activities were going to be piloted later in the LifeLab project.

The facilitator (CB), conducted all FGDs following the semi-structured topic guide (Merriam, 2009, p. 102). Natural conversation was encouraged between the participants in FGDs and prompts were used to follow-up on key topics discussed, with the help of two master's students. The master's students were present in most of the FGDs as observers, as part of their data collection.

At the start of the FGDs, the facilitator and observers introduced themselves and the study again, followed by a reminder about anonymity and data handling, that there were no right or wrong answers to the questions, and that all of the information they wished to share was valuable.

All FGDs were recorded with a digital voice recorder and transcribed verbatim immediately after data collection. Field notes were written down after each school visit.

Data analysis

The transcripts were uploaded to NVivo 12 Pro, which was used for coding and data handling, and thematic analysis was performed, following Braun and Clarke's (2006) step-by-step approach.

During the first part of the analysis, the researcher familiarised with the data. Initial thoughts about the data and possible emerging themes were noted throughout these initial phases. All transcripts were inductively coded. Similar codes were renamed, others were discarded. For instance, the codes *applicability of learning tasks* and *preferring variation in learning tasks* were merged into *criteria for classroom activities*, which eventually became part of the theme *pedagogical solutions to resolve the mismatch*. The codes were revisited and revised and finally merged into categories of similar codes. These categories were revisited once coding was completed and, through discussion with the research team, developed into themes which were reviewed, defined and named (Braun & Clarke, 2006). Themes and codes were reviewed to check if the codes worked in relation to its extracts, and whether the themes worked in relation to the dataset and the research question. Although the qualitative analysis will not capture an objective "truth" (Merriam, 2009), this will strengthen the trustworthiness of the findings, as it relates to "the 'fit' between the respondents' views and the researcher's representation of them" (Nowell, Norris, White, & Moules, 2017, p. 3). The process of creating and identifying codes and themes is reflexive (Braun & Clarke, 2006, p. 86; Braun, Clarke, Hayfield, & Terry, 2018), in which one continually moves back and forth through the different phases.

Quotations are presented liberally throughout to enable the students and teachers voices to be clear.

The consolidated criteria for reporting qualitative research (COREQ checklist) was followed when outlining this method section.

Ethical considerations

All participants provided written informed consent (Fossheim, 2015). The participating teachers signed their own consent form, and parents consented on behalf of their children (the students) who were between 11 and 15 years old (NSD Data Protection Services, 2018). If there were more than 5–8 students available for the FGD, the teacher selected the desired number of students from those who had consent to participate. Students provided assent by participating.

The study is approved by the Norwegian Centre for Research Data (ref.59097) and the Faculty of Health and Sports Sciences Ethics Committee at the University of Agder.

Results

Three overarching themes were identified in the qualitative analysis: 1) students and teachers value cooking 2), limited time, and 3) pedagogical solutions to resolve the mismatch.

Students and teachers value cooking

This theme illustrates why students and teacher find cooking-related activities worthwhile. The practical aspect of the subject is valued by the students and supported by the teachers who allocate most time for cooking during the lessons.

During the FGDs with the students, it was evident that FH is a popular subject, which they describe as fun. All students provided positive descriptions, demonstrating that they highly valued the subject. When asking the students what they liked best about FH, there was a unanimous agreement that they enjoyed cooking and eating. As the school day is filled with academic classes, the practical and interactive nature of FH was of key importance to the students in addition to being able to socialise with their friends:

- Student 1: I think it's very nice. It's nice to have some breaks from the regular theoretical classes.
- Student 2: And it's actually quite fun too. When you can socialise with your classmates and also collaborate on something. Also doing stuff on your own.
- Student 3: It's very useful. It's really quite useful.
- Interviewer: In what way?
- Student 3: cooking and making food is something you need no matter what. Because we learn to make healthy food, unhealthy food, all different kinds of food ... that's stuff we need in everyday life ... if you are home alone or going out with friends and you are cooking, then it's always useful (two boys and one girl, 9th grade, school 1)

Teachers were aware that students highly valued FH in a way that was unique compared to the other more academic subjects:

It's a subject they [the students] are very much looking forward to, they really look forward to Food and Health ... because then they cook (Teacher, school 1).

Similarly to the student reports, the teachers felt that FH was so popular among students because they are given the opportunity to develop mastery in the subject and because it is practical. In addition, they emphasised that the practical aspect was especially valuable for the academically weaker students. It was evident that it was not necessarily the academically stronger students who mastered FH.

From the FGDs, it is evident that FH is operationalised as a subject centred on cooking. When asking the students to describe a typical FH class, all gave very similar descriptions: The teachers first present the meal plan and describes or demonstrates how to do it. Then, the students go in groups and prepare the dishes themselves, with the help of the teacher if necessary, before they eat and clean up. Although there were some exceptions to this structure during the school year e.g. by having a cooking project they worked on or had a day were they just worked on theoretical concepts, this description was common:

Ehm, we enter [the school kitchen] and then we are explained what we are making today and what to do. Then she [the teacher] shows us how to do it and how to cut things at this table that we have. Then we cook and then we tend to do the dishes before recess (Boy, 7th grade, school 3).

The teachers talked about students having insufficient skills related to reading recipes to be the main reason for spending time on explaining or demonstration before the students got to prepare the dishes themselves. Limited experience with using different kitchen utensils among some students was also highlighted as challenging by the teachers. By demonstrating first, they experienced fewer questions regarding the recipes afterwards when the students were cooking, and this facilitated better progress during the lesson. Although demonstration was apparent in all schools, some teachers emphasised the importance of letting students try and fail during cooking, and that the recipe is not something definitive, but a basis. Hence, this was an important part of the learning process.

Although teachers believed it was important to include cooking in FH lessons because this was what the students enjoyed, they also emphasised nutrition education to be of great importance. However, how teachers incorporated nutrition education into FH lessons varied. Most schools incorporated it into the practical cooking. Nonetheless, one teacher stated that topics like health and lifestyle do not get communicated well enough to the students during the practical work (cooking). Therefore, he advocated for allocating more time for nutrition education and that how nutrition education is taught in FH classes should be strengthened. In the FGD with the 9th graders at this school, the students mentioned that they did not learn a lot about the connections between diet and health in FH classes, but more so in the subjects Physical Education and the optional subject Physical Activity and Health, which supports the statement provided by the teacher.

Limited time

Although teachers and students both highly valued the practical side of FH, teachers emphasised the importance of including nutrition education in their lesson. Despite

wanting to include nutrition education, this theme highlights the time pressures that the teachers are working under in FH and how it impacts their teaching.

FH is the smallest mandatory subject in Norwegian schools when measured in teaching hours, and in the interviews, it was expressed that they had between two and two and a half hours each lesson. From the FGDs with the teachers, it was clear that finding time for learning tasks related to theory was difficult. Most of the time was spent on demonstration, cooking, eating, and cleaning, leaving little time for nutrition education. A teacher expressed how she once started the class by introducing some theory, but as this resulted in such a hurry later in the lesson, this was something she had to skip next time. Hence, cooking was the prioritised activity in FH lessons. Teachers' expressed the desire to have dedicated time to teach both theory and practical cooking in FH. However, they expressed a sense of helplessness in being able to do so given their time limitations. One teacher expressed feeling that it would be "impossible" to carry out all FH activities in the limited time provided. All of the teachers introduced as much of the theory as they could, within the limited time available. They did so because they recognised nutrition education, and more particularly the subject itself, to be of great importance. Most of this theoretical teaching was provided by the teacher by either talking about it before the practical work, during cooking, or while eating. Hence, how theory was taught to students differed between the schools. The students were also given nutrition education homework, usually a reading, because there was limited time for working with this during class:

In order to make time for everything, because we are in such a hurry in the school kitchen, they get theoretical homework and then we talk a bit about the theory while they eat (Teacher 1, school 2)

Although the students did not mention time scarcity to be an issue, the students recognised that the teachers had different practices when it comes to communicating the theory:

Student 1: you said [refers to her classmate] that you had some theory while you ate, but we just sat and talked.

Student 2: We kind of had theory when we were done eating, so we ate ... and then when everyone was finished, she [the teacher] started talking a bit. And if there was anyone still eating, she would ask them to stop eating until she was done talking, so yeah ... (Two girls, 10th grade, school 2)

Time, or lack of it, appeared to be of great importance to all of the teachers. They expressed a great desire for more hours to teach FH to enhance the quality of students' learning. Hence, time scarcity in FH seemed to be the biggest challenge from the teachers' perspective. They felt that more time would facilitate and promote deeper learning among students, as they would have more time to study each topic in depth. The teachers would also have time for both demonstration and cooking, in addition to working sufficiently with the theoretical content.

When talking to the teachers about teaching and their experiences with learning activities like exploratory or experimental learning activities in FH, a teacher replied that this was also difficult to implement due to time restrictions:

I feel that the kids find it [exploratory/experimental activities] very fun. And sometimes you wish that you had more time to plan for such activities, it's kind of how one would like to teach maybe ... but lack of time kind of puts a stop for that too (Teacher 3, school 3)

Not only was there limited time to engage the students in the required classroom learning but the teachers felt they were unable to engage in the appropriate preparation for their practical activities. The will to teach differently in FH classes is thus there, but according to the teachers, limited time inhibits them from doing so. This was especially prominent at one of the schools, where the FH classes recently had been reduced from 2.5 hours a week, to 2 hours a week.

Pedagogical solutions to resolve the mismatch

Findings suggest cooking is highly valued and prioritised in FH lessons. However, teachers emphasise the importance of nutrition education, but feel the limited time available for the subject limits what they can achieve as teachers. This final theme highlights suggestions made by students and teachers on what to consider in developing and implementing student active learning tasks targeting nutrition education in FH, aiming to resolve this mismatch between teaching practices and curriculum guidelines.

There was lots of discussion in all FGDs regarding how the learning tasks should be outlined. Specifically, the teachers also discussed potential ways in which they would be able to use and implement new learning tasks. One of the criteria highlighted by the teachers was that the learning tasks should benefit the students and comply with the subject's curriculum and competence aims:

...I guess it must be something that the students benefit from. And that you see that it is in accordance with the competence aims and also that the students think it's fun, I guess (Teacher, school 1)

A second criterion reported by the teachers was related to how the activities should be outlined. Pedagogical approaches and theories that were mentioned were; learning by doing, Vygotsky and Russian maths. A main finding among the teachers was that learning tasks should be practical. A combination of practical learning tasks and dialogue with the students was mentioned by several teachers as valuable. This way, the teachers could ask the students probing questions, which was highlighted as important also during cooking by some of the teachers. Another important aspect highlighted by the teachers was that the activities must be easy to adapt and flexible to use. Words used by the teachers were user-friendly, intuitive, leeway, and framework:

"It must be user-friendly. That's super important!" (Teacher 1, school 2)

Teachers wanted ownership of what they do in class. A common feature was that teachers would appreciate having a "bank of ideas" where they could pick different activities, which are easy to use and easy to adapt to their classes. There were a number of benefits associated with having this "bank of ideas" including that it would save time on designing the tasks themselves, and at the same time make it work in their class. This was something several teachers felt was missing. One teacher stated that they did

not have time to include activities directed at nutrition education the way FH classes was run today. Some teachers however, had discovered ways in which to teach in creative ways that did not take up too much of their limited time. For example, one teacher gave an example of how he greeted the students with his hands covered in glitter before the class to demonstrate how bacteria and other microbes easily spread. This demonstrates how easy one can include a practical and quick demonstration in educating the students about hygiene.

Although FH is a practical subject, most students found learning about nutrition and health interesting, and some of them wished they learned more about it. In one of the schools, theory and practice were experienced as very separate the way it was taught today. The students described that they began the school year with practical cooking lessons, then they were introduced to lots of theory during a short period of time, followed by a large examination in the middle of the school year, before ending the year with cooking lessons again. When asked what other way to teach the theory in the subject, a student replied:

I think it was a bit random that we would go through all types of dishes ... but if it had been more planned and merged together with theory ... so for example, if the topic was fish ... then we made dishes with fish and then the last half hour, if we skipped dessert, we could have theory related to fish the last half hour ... so we didn't have to wait like two weeks before we had the theory about fish ... then that was forgotten too ... (Boy, 10th grade, school 2)

Although this student suggesting cutting down on one dish to include more nutrition education, some students expressed that they already learned enough or that the teachers could just incorporate nutrition education into the practical work (cooking):

Maybe a bit more (nutrition education) while we prepared the dishes, she could explain a bit more about, this is important to eat and stuff ... like, this you should not eat that often, and stuff like that (Girl, 7th grade, school 3)

The majority of students struggled to think of ways nutrition education could be taught differently. Instead, they focussed on discussing the learning techniques they enjoyed in general. From the student FGDs, it was clear that there were differences in how they generally preferred to learn which indicates that variation in learning tasks is an important principal itself. Some liked reading, some liked experimenting, and some liked discussing. Nonetheless, the most evident finding was that most students appreciated active learning tasks where they were involved in the tasks and tried things out themselves. The students also highlighted the importance of tasks being “fun”. Fun was a word they often used when they described the activities they preferred:

I really like it when we don't just work in the textbook or something like that, but when we actually do fun things, but yet learn something (Girl, 6th grade, school 1)

When talking about fun learning tasks with another group, a student explained that the element of fun was important because this was what made them want to continue. Hence, fun was a big motivator for learning.

The idea that fun tasks are important for learning was also supported by one of the teachers when asked which activities he thinks engages the students:

... I do look at the learning outcomes, and that is often related to what they think is fun ... that's when they get to explore a bit themselves ... (Teacher, school 1)

This illustrates that both students and teachers emphasise practical and fun learning tasks as important for both student motivation and learning outcome and should, therefore, be considered.

Discussion

This study aimed to explore teachers' and students' perspectives and experiences of current classroom practices in the school subject FH. Based on the FGDs conducted, this study found FH to be a popular and highly valued subject. Both students and teachers enjoyed the practical element of cooking, which seems to be so dominating that it overshadows most of the nutrition education that moves beyond the development of cooking skills. The teachers describe time scarcity in FH to limit what they can achieve as FH teachers, and despite recognising the importance of nutrition education, cooking was prioritised. This represents a mismatch between teaching practices and curriculum guidelines, which has a strong emphasis on nutrition and health education (Directorate for Education and Training, 2006). In one of the student interviews, it became clear that the students usually cooked three separate dishes within each lesson. Although the teachers recognised the importance of nutrition education, within the limited time frame for FH, cooking was clearly prioritised. The suggestions from the respondents represents a missed opportunity, where both teachers and students recognised the importance of nutrition education and gave suggestions for engaging ways in which nutrition education could be introduced into the subject which would narrow the gap between curriculum guidelines and practice (see [Figure 1](#) for thematic map).

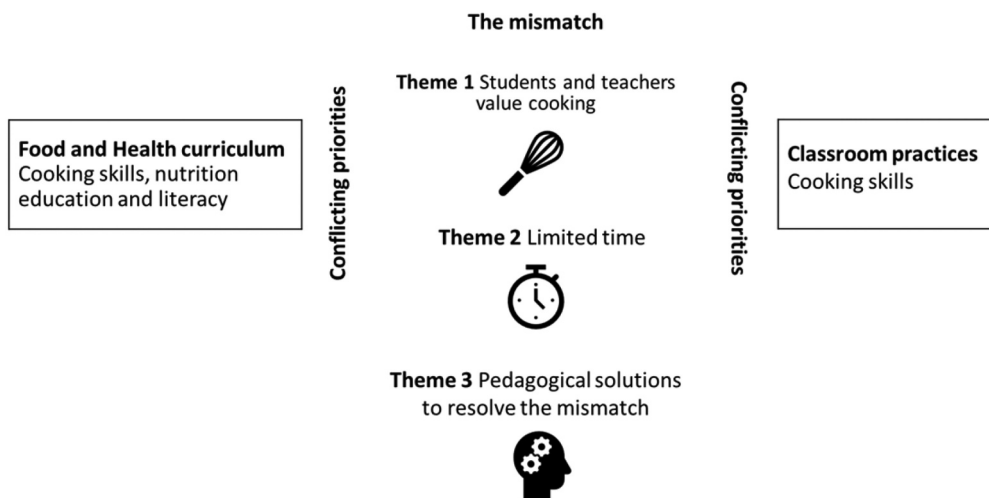


Figure 1. Thematic map of the themes identified, and the mismatch discovered. The LifeLab Food and Health project

A study conducted in 2005 by Øvrebø (2014) investigated nutrition knowledge and attitudes among 606 eighth and tenth graders in north of Norway. Only 40% of the tenth graders said they had learned about nutrition in their FH lessons. Although the study took place some years ago, the 1996 curricula stated that the students should build an understanding of the relationship between diet, lifestyle and health, to be able to choose a healthy lifestyle (Ministry of Church, Teaching and Research, 1996). The statement is similar to one of the current curriculum aims of the subject, which states that “*the teaching in the subject should contribute to a lifestyle with awareness of what promotes good health*” (Directorate for Education and Training, 2006, p. 1). Our data indicate that the issues discovered by Øvrebø (2014), relating to low emphasis on nutrition education is also evident in today’s teaching. The theoretical issues related to diet and health gets “squeezed in” where possible and is not something that is given much priority in FH lessons. From the way classroom practices are planned in these three schools, it is clear that the main focus is about developing cooking skills, with lots of emphasis and time allocated to demonstrations followed by cooking. This is in line with the observations and interviews conducted by Veka et al. (2018), who even called the recipe the “hidden curriculum”, meaning that since the recipe was so dominating in how the teaching was planned and conducted, it could be regarded as a new curriculum level itself. Hence, they too observed a mismatch between teaching practice through the “hidden curriculum”, and the formal FH curriculum. They also discovered that all FH classes was organised in the same way, by introduction, cooking, eating and cleaning, equal to our findings (Veka et al., 2018). In Sweden, Höijer, Hjalmskog, and Fjellström (2011, p. 518) stated that “cooking in Home Economics is used as a means to assess the pupils with focus on methods, recipes and ability to follow instructions”. Hence, this issue is also apparent in other countries with similar subjects. A strong focus on following recipes, with less focus on creativity and experimentation, was also found in the Norwegian school subject survey (Espeland et al., 2013). As the FH curriculum states that the subject shall support elements like creativity, experimentation and exploration (Directorate for Education and Training, 2006, 2019b), teachers in FH who admits to this way of teaching, need to consider how they design their learning assignments, to better meet the demands of the curriculum. Finally, according to our findings, both students and teachers highlighted learning tasks were the students get to explore and try things out themselves to be valuable.

The narrow focus on cooking is also not in line with either the current or upcoming curricula, which are much more comprehensive, by also emphasising elements like critical thinking, sustainability and developing awareness of the connection between diet and health, i.e. nutrition education (Directorate for Education and Training, 2006, 2019b). The strong emphasis on cooking in today’s teaching may be explained by looking into the long tradition of FH education in Norway, where practical work in the kitchen always has been central (Askeland et al., 2017).

Both students and teachers recognised nutrition education to be important. Still, as the subject has few hours allocated each week, our data show that delivering high-quality nutrition education was not prioritised in the FH classes. For students in 7th grade to achieve competency aims such as “*explain how food functions as a source of energy and body-building substances*” (Directorate for Education and Training, 2006, p. 3) or in 9th grade “*inform others about how eating habits might influence diseases that*

are connected to lifestyle and eating” (Directorate for Education and Training, 2006, p. 4), it is essential that students learn about the complexity of nutrition, and not solely cooking skills, cf. Pendergast and Dewhurst (2012). In the new curricula, students in 7th grade should be able to “use food labelling and dietary models to put together a healthy, varied and sustainable diet and reflect on their choices” (Directorate for Education and Training, 2019b, p. 5) and in 9th grade be able to “explain and critically evaluate claims, advice and information about diet and health” (Directorate for Education and Training, 2019b, p. 6), to mention a couple of the competence aims. For students to achieve the competences described in the FH curriculum, it requires they possess in-depth knowledge of food and nutrition. The importance of nutrition and food knowledge is also supported by literature regarding adolescent food literacy and dietary behaviour (Amin et al., 2019; Mekonnen et al., 2020; Ronto et al., 2016). Therefore, nutrition education should get a higher priority in FH classes.

In relation to learning, teachers lecturing contrast strongly with active learning and the sociocultural view of learning, where the focus is on active participation and social interaction amongst the students (Bonwell & Eison, 1991; John-Steiner & Mahn, 1996). Our results show that the students prefer student active learning tasks when learning something new; they want to solve problems, discuss, and experiment. The new core curriculum highlights experimenting and exploring as important for in-depth learning (Directorate for Education and Training, 2019a). The teachers also specify that they want to teach differently, but that time scarcity is making this difficult. Issues relating to time scarcity has also been raised in Swedish Home Economics classes (Höijer et al., 2011; Lindblom, Erixon Arreman, Bohm, & Hörnell, 2016), where researchers question whether it is possible to fit the curriculum within the limited time frame (Lindblom et al., 2016). Our findings suggest this question is just as relevant in the Norwegian context.

The Ministry of Education and Research (2016) states the importance of students being actively involved in the learning process. FH lessons can be altered to be more than one-way communication from teacher to students, but this requires teachers to reduce time spent on pure lecturing, and free up time for activating learning tasks, dialogues, and discussions. Although some students prefer and enjoy lectures as a way of learning new material (from teachers they see as good communicators), most students do not. Some of the teachers find it challenging to teach nutrition-related topics because they recognise how much students enjoy cooking. However, given the way nutrition topics, for the most part, is communicated in FH classes studied here, it is conceivable that students would have a more positive attitude towards nutrition education if it were communicated in a more student-activating way. The example presented earlier, regarding the teacher who once greeted the students at the beginning of the class with his hand covered in glitter, demonstrates a simple, quick, and powerful way of illustrating the importance of proper kitchen hygiene to the students. In this way, students are activated more than by lecturing the importance of proper hygiene to them.

During cooking, the students get to be active and collaborate with each other. This approach should also be apparent in the more theoretical nutrition education. Hence, the focus on more problem-solving and experimental learning activities in FH could be used to change the teacher-led pedagogic practices observed in this

study. We suggest teachers should more than now consider how they support students learning the nutrition-related, more theoretical contents of the FH lessons. If teachers can shift the focus in classrooms, from their teaching to students learning, then they can better create links to the practical work, as proposed by the Ministry of Education and Research (2019). This may then modify the problem observed here: theory (i.e. nutrition-related concepts) and practice (i.e. cooking) are seen too detached. Cooking should be learning tasks, aiming to link the food preparation to the broader curricular goals, and the objectives of nutrition education. Also, the core elements described in the new FH curriculum, seem to have a stronger focus on the students learning the different aspects of the subject through cooking. For instance, under the core element “health-promoting diet”, it is described that the students shall develop knowledge of a healthy diet through cooking and preparing meals (Directorate for Education and Training, 2019b). This stresses the importance of teachers finding solutions to how the theory and practice can be better interconnected.

Strengths and limitations

A strength of study is that it includes data from both teachers and students. These have direct experience with the topics discussed, but from different perspectives, which was important to our research question. Also, FGD is regarded valuable to explore common experiences (Malterud, 2012; Merriam, 2009). To our knowledge, this is the first study in Norway to explore how students experience the subject.

There are some limitations to this study that are important to note. First, findings from this qualitative study, is not meant to be generalised. Also, schools selected for this study were based on convenient selection and were known to have educated teachers who were committed to the subject. Only one teacher in school 2 did not have a formal FH teacher education. Furthermore, all students participated in FGDs in one of the schools, while at the other two schools, the teachers selected the students to participate among those who had consented. This may mean that the most engaged and motivated students were chosen to participate.

Finally, the facilitator had little experience conducting FGDs. This limitation was mitigated by training in qualitative methods, with a focus on thematic analysis, and supervision by experienced researchers throughout the project. A pilot FGD was also conducted, and in the first two FGDs, a more experienced qualitative researcher participated for corrections and feedback. Topic guides were also developed in this collaboration. The facilitator is the source for data collection, and to get good data, it is essential to ask good questions, and this takes practice (Merriam, 2009, p. 95). The quality of the FGD is crucial for the quality of the findings to be analysed, verified, and finally expressed (Kvale & Brinkmann, 2009, p. 174).

Conclusion and implications for further work

Our findings indicate that there is a mismatch between teaching practices and curriculum guidelines in FH. Teachers express that there is both a desire and need for a change in both how, and to what extent nutrition education is communicated in the FH classes

investigated here. FH is a key subject for the development of an understanding of the connections between diet and health, and the emphasis on in-depth learning and interdisciplinarity in the school of the future requires other learning strategies beyond lecturing and homework. Thus, more research on learning strategies targeting nutrition education is needed.

The teachers and students included in this study were all engaged and enthusiastic about the subject. We consider this engagement and the proposed solution found here a missed opportunity. There is a lot to be done to improve the pedagogical implications of nutrition education in FH. Both the current and the upcoming FH curriculum is ambitious in terms of content and aims. Therefore, in order for the subject to meet the demands of the new FH curriculum, FH teachers need to consider how they support students in learning the more theoretical contents of the FH curriculum. Our findings suggest that the development of various student-activating learning task for FH can assist teachers who experience limited time to develop such activities themselves. These findings can be used to inform teacher educators and policymakers on how to strengthen nutrition education in FH. We propose a focus on comprehensive nutrition education, as this can affect the quality of teaching practices in classrooms, which in turn can affect how strong role FH can have as an arena for health promotion among children and adolescents in Norway.

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Paper IV

“Is there any sugar in bread?": A qualitative video analysis of student activating learning tasks in Home Economics

“Is there any sugar in bread?”: A qualitative video analysis of student activating learning tasks in Home Economics

Abstract

The Norwegian Food and Health (FH) school subject aims to develop students' ability to understand the association between diet and health. Research on FH in Norway indicates that the main focus today is on cooking and the development of practical cooking skills, leaving little emphasis on activities related to the more theoretical aspects of the curriculum. To increase students' knowledge and skills regarding nutrition and health, we aimed to evaluate three newly developed students activating learning tasks. Three 6th grade FH classes in southern Norway participated. Audio and video recording of the learning tasks were used to evaluate the activities. Also, data from the focus group discussions with FH teachers and students, which were conducted afterwards, was included in the analysis. By emphasizing sociocultural learning and using the skills highlighted as essential in social learning and development as basis for the activities, we found the activities valuable in working with FH. Through working in groups, and facilitate interaction and dialogue, communication and collaboration, and by being given the opportunity to listen and argue, the students learning process was stimulated in working with the learning tasks. Language was used as a pedagogical tool and was central in the students learning process. Both the students and their teachers valued the active and practical outline of the learning tasks. We propose a stronger emphasis on practical learning tasks in FH, to strengthen the students social learning and thus the learning in the subject, by using this as a pedagogical approach in FH classrooms.

Keywords: Food and Health, Home Economics, social learning, sociocultural learning, learning tasks, video analysis

“Er det sukker i brød?»: En kvalitativ videoanalyse av elev-aktive læringsaktiviteter i Mat og Helse

Sammendrag

Mat og Helse (MH) i skolen har som mål å utvikle elevenes evne til å forstå sammenhengen mellom kosthold og helse. Forskning på MH i Norge indikerer at hovedfokuset i dag er på matlaging og utvikling av praktiske matlagingsferdigheter, men mindre fokus på aktiviteter som retter seg mot det mer teoretiske innholdet i læreplanen. For å øke elevenes kunnskaper og ferdigheter relatert til ernæring og helse, ønsket vi å evaluere tre nyutviklede elev-aktive læringsaktiviteter utviklet spesielt til MH faget. Tre 6. klasser i Sør-Norge var med på utprøvingen av aktivitetene og lyd- og videoopptak ble brukt til å evaluere aktivitetene. I tillegg ble data fra fokusgruppeintervjuer med MH-lærere og elever som ble gjennomført i etterkant inkludert i analysen. Aktivitetene viste seg å være nyttige i arbeidet med MH, ved å legge vekt på sosiokulturell læring og bruke ferdighetene som er trukket fram som essensielle i sosial læring og utvikling som grunnlag for aktivitetene. Ved å tilrettelegge for at elevene kan jobbe i grupper og ved å oppfordre til interaksjon og dialog, kommunikasjon og samarbeid, og til å lytte og argumentere, ble deres læringsprosess stimulert i arbeidet med oppgavene. I et sosiokulturelt perspektiv, er det nærliggende å anta at dette virker positivt på elevenes læringsprosess, da språket er et sentralt pedagogisk verktøy. Under fokusgruppeintervjuene kom det frem at både elevene og lærerne verdsatte at aktivitetene var elev-aktive og praktiske. Basert på dette foreslår vi et større fokus på praktiske læringsaktiviteter i MH, for å styrke elevenes sosiale læring og dermed læring i faget ved bruke dette som en pedagogisk tilnærming.

Nøkkelord: Mat og Helse, sosial læring, sosiokulturell læring, læringsaktiviteter, videoanalyse

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Introduction

In Norway, Food and Health (FH) is a mandatory school subject most often present in 6th and 9th grade. Formally known internationally as Home Economics (HE), FH is one of four practical, aesthetical subjects (Borgen et al., 2020; Ministry of Education and Research, 2019, p. 8). Moving forward, the Norwegian government aims to increase the subject's status and strengthen the content of the practical and aesthetic subjects and teacher education, by, e.g. offering continuing education and Master's degrees and facilitating more practical and explorative work (Ministry of Education and Research, 2019).

FH aims to develop students' understanding of the association between diet and health (Directorate for Education and Training, 2019b). Further, FH helps students develop critical thinking, ethical awareness, and a sense of responsibility, enabling them to choose health-promoting and sustainable foods. The students shall learn to plan, cook, and experience meals with their peers.

Norwegian school subjects are currently undergoing a renewal (Ministry of Education and Research, 2015), with the new curriculum gradually implemented by the year 2023 (Directorate for Education and Training, 2020). Teaching in school should develop students' critical thinking, ethical awareness, and in-depth learning (Directorate for Education and Training, 2019a, p. 7). The new core curriculum has maintained the five basic skills of reading, writing, numeracy, and oral and digital skills (Directorate for Education and Training, 2019a, p. 12) to be integrated across all subjects, some of which are also recommended by the European Commission (World Health Organization, n.d.). In FH, oral skills are described as the ability to participate in discussions regarding cooking, health, food consumption, and food security, to mention some (Directorate for Education and Training, 2019b).

Interaction and dialogue, communication and collaboration, and the ability to listen but also to argue for one's views are described as crucial in social learning and development (Directorate for Education and Training, 2019a). They are also important skills to be developed in the school of the future (Ministry of Education and Research, 2015). In working with the student's development of these skills in school, this can be used as a pedagogical approach in FH lessons. Within a sociocultural view of learning, individual and social processes are dependent on each other (John-Steiner & Mahn, 1996; Säljö, 2001; Vygotsky, 1978). The distance between which challenges a student can solve by themselves and what they can solve

with guidance from a teacher or in collaboration with peers is what Vygotsky calls the zone of proximal development (ZPD) (Vygotsky, 1978, p. 86). In the ZPD, students who would not be able to solve a task by themselves can achieve so in collaboration with others. Language can thus be viewed as an important educational tool, which is also found at the core of collective thinking, i.e. using language as a tool for problem-solving among individuals (Mercer, 2013; Säljö, 2001). When students solve problems collaboratively, through discussions and argumentation, is what Mercer calls exploratory talk (Mercer, 2002). When students master this communication skill, this can positively impact student learning (Gillies, 2019).

In HE education, Taar (2017) found student interaction skills and group atmosphere important for students to attain the benefits of collaborative learning and also for reaching the ZPD. She argues for including more cognitive-oriented tasks into HE education where students can develop their interthinking skills, an advanced form of collective thinking. Lindbom et al. (2016) studied group work interaction during students' food preparation. They found 15 out of 26 student groups categorised as integrated groups, which are similar to collaborative groups. These groups were regarded as the most beneficial in terms of learning outcome, since the students reflect, develop new ideas, and gain knowledge from each other. Thus, for students to achieve the desired learning outcome, teachers need to be aware of how they design lessons to achieve well-functioning group work.

Research in Norway indicates that the main focus in teaching FH is on cooking and developing cooking skills (Beinert, Øverby, et al., 2020; Øvrebø, 2014; Veka et al., 2018). This leaves little time and emphasis on activities focusing on the more theoretically challenging aspects of the FH curriculum, like the ability to describe, discuss, reflect, and assess different nutrition and health-related topics (Directorate for Education and Training, 2006, 2019b). Student-activating learning tasks (Gogus, 2012), where students are involved in the learning activities, are generally regarded as effective in enhancing student learning (Nordenbo et al., 2008, p. 55). Learning strategies where students play an active role, such as collaborative learning (Udvari-Solner, 2012), problem-based learning, (Jonassen & Hung, 2012) or experimental learning, and class discussion can be valuable to use in FH lessons. One governmental initiative is to develop tools and resources for the FH subject to increase the population's knowledge of food, diet, and health as well as increase the competence among FH teachers (Ministry of Health and Care Services, 2017). The school and the FH

subject are thus recognised as important arenas for health promotion among children and adolescents.

This study reports the findings from the “LifeLab Food and Health” project (see also Beinert, Øverby, et al., 2020; Beinert, Palojoki, et al., 2020). LifeLab aimed to develop and evaluate different student-activating learning tasks for the FH subject, which intends to increase students’ knowledge and skills regarding the association between diet and health. Initially, in the LifeLab project, three primary and lower secondary schools were recruited, and focus group discussions (FGDs) were conducted with both students and FH teachers. These FGDs aimed to explore their experiences with current teaching practices and use this feedback to develop the LifeLab learning tasks. Eventually, six student-activating learning tasks were developed and tested in FH classes. For this, two of the three schools were again contacted, and their permission to collect the data was obtained.

This present study aims to explore how three of the learning tasks developed in the LifeLab project can contribute to active learning among students during FH lessons by taking a sociocultural approach to learning and building on skills important in social learning and development described in the core curriculum (Directorate for Education and Training, 2019a, p. 10). More specifically, there are three research questions to be answered:

1. How do the learning tasks support student interaction and dialogue?
2. How do the learning tasks create opportunities for communication and collaboration between students?
3. How do the learning tasks support students’ abilities to listen and argue?

Method

Developing LifeLab learning tasks

The three developed learning tasks tested in this study had the overall theme of “food choices” (Table 1). The tasks were developed through three workshops led by the first author of this paper, consisting of six participants, two of whom were university students specialising in the subject FH in their final year of teacher education with FH specialisation and one FH teacher who recently graduated. Also, one research assistant and one graduate student working within the project attended. The learning tasks were developed based on the FGDs conducted with FH teachers and students, described previously. Also, both the current FH

curriculum (Directorate for Education and Training, 2006), the existing documents regarding the new curriculum's in general (Ministry of Education and Research, 2016) and preliminary hearings and reports (Ministry of Education and Research, 2018, p. 8) regarding the new FH curriculum were taken into consideration in the development. A description of the learning tasks alongside competence aims is presented in Table 1. Each learning task lasted approximately 15-20 minutes.

Table 1. Overview of the competence aims, description of the learning tasks, and the pedagogical approach of the different learning tasks.

Learning task	Competence aims in the subject, 7th grade	Description	Pedagogics Active learning (Gogus, 2012)
1. Picture ranking	<p><i>Food and lifestyle:</i> “talk about guidelines for healthy eating from the health authorities, and provide examples of the relation between eating, health, and lifestyle.”</p> <p><i>Food and culture:</i> “assess what good eating habits involve.”</p>	<p>The students were handed 8 pictures of different food items, which they were asked to arrange from which the thought was the healthiest/most nutritious to the least healthy/least nutritious. These were a picture of a glass of orange juice and a glass of chocolate milk, a bowl of chocolate cereal, a bowl of whole-grain cereal, a slice of bread with chocolate spread, a slice of bread with brown cheese and tomatoes on the side, a fruit yoghurt and a natural yoghurt with fresh berries, honey and granola on top.</p> <p>They were asked to discuss together in the group to come to an agreement and argue for</p>	<p>Collaborative learning (Udvari-Solner, 2012)</p> <p>Problem-based learning (Jonassen & Hung, 2012)</p> <p>Activating students through class discussion, reflection, and argumentation</p>

		<p>their opinions.</p> <p>Afterwards, the research assistant led a discussion with the class by going through them and collaboratively trying to arrange them.</p>	
<p>2. The hunt for “5 a day”</p>	<p><i>Food and lifestyle:</i> “talk about guidelines for healthy eating from the health authorities, and provide examples of the relation between eating, health and lifestyle.”</p> <p><i>Food and culture:</i> “assess what good eating habits involve.”</p>	<p>The students were asked to collect the amount of fruit and vegetables they believed was the amount of “5 a day” from a selection available. After weighing it, they were asked to peel and weigh again.</p> <p>Then, if any had taken the potato, which is not included in the 5 a day, they were asked to remove it to visualise the net amount.</p> <p>Finally, the research assistant talked about what is included in the “5 a day” with the students.</p>	<p>Explorative learning/discovery learning</p>
<p>3. Line game (bread)</p>	<p><i>Food and lifestyle:</i> “talk about guidelines for healthy eating from the health authorities, and provide examples of the relation between eating, health and lifestyle.”</p> <p><i>Food and culture:</i> “assess what good eating habits involve.”</p> <p>“talk about industrially prepared food and food prepared in large-scale</p>	<p>The students were shown two types of bread, one wholemeal and one white bread.</p> <p>Then, the students were placing themselves on a line, from high to low level of wholemeal (based on the bread scale labelling (“Brødskalaen” in Norwegian), based on where they believed the bread belonged.</p> <p>Then they were present the</p>	<p>Reflection and argumentation (Mercer, 2013)</p>

	<p>catering.”</p> <p><i>Food and consumption:</i></p> <p>“discuss product information and advertising for various foods”</p>	<p>actual wholemeal content of each bread by seeing the package labelling.</p> <p>Finally, the research assistant explained food labelling and the nutritional value of the bread in dialogue with the students.</p>	
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Recruitment and ethics

Since different FH students participated in this data collection phase, new information sheets and parental consent forms were sent electronically to the teachers, who printed and handed them out to the students. As the parents had given their consent, the students provided assent by participating. The FH teachers and assistants gave oral consent to participate in the study. Students who were not allowed to participate were offered an alternative learning task arranged by the FH teacher in a separate room during data collection. The Norwegian Centre Research Data assessed the project (ref.59097), and the Ethics Committee of the Faculty of Health and Sport Sciences at the University of Agder provided research permission.

A short visit to the schools was made two weeks in advance of data collection to meet the students and teachers and briefly inform them about the study. The students were also reminded about having their parents sign the consent forms, which the FH teachers had previously handed out. The signed consent forms were collected at the time of data collection.

Participants

The first testing was conducted in March 2019 in one 6th grade class (students aged 11) consisting of 13 students at one school (group 1). Four weeks after this, the activities were carried out in two 6th grade classes at the second school, with 15 students in each class (groups 2 and 3). Only two minor corrections were done after the first testing regarding camera placement and student arrangement during the line game. Therefore, these videos are included in the analysis. However, most emphasis is placed on the second school due to better sound quality, thus covering a higher percentage of the analysed data. A total of three classes and 43 students were included in the final analysis.

Data collection

The Master's level student and the research assistant conducted the teaching in group 1, while the research assistant and one of the FH teacher-students taught the class in groups 2 and 3, now referred to as "assistants". To minimise the FH teachers' burden in the included schools, the assistants were responsible for carrying out the LifeLab tasks in the two schools. The FH teachers at the schools, now referred to as "FH teacher", received all information about the learning tasks in advance and were encouraged to participate as much as they wanted. The first author of this paper conducted a non-participatory observation, and field notes were written. Each lesson lasted for two school hours (2 x 45-minutes) and was held in a regular classroom (not a school kitchen) during the regular FH class time. The students were sitting in groups of three to four students, arranged by the FH teacher in the groups they were working in during regular FH lessons. These were both mixed and non-mixed gender groups.

Audio and video recordings were used to evaluate the learning task. Garmin Virb 360-degree cameras and GoPro Hero 180-degree cameras were used to capture both verbal and non-verbal communication in the classrooms. The students were placed at the corner of the desk, with one camera in the centre (Figure 1), which was standing on a small tripod (10cm approx.). This captured both student-student interaction and student-teacher/assistant interaction. Placing the cameras this way, the students were close to the camera and were able to work together simultaneously as they could see the assistant or whiteboard when necessary. In educational classroom research, video recording has been a widely used method for data collection (Derry et al., 2010; Erickson, 2006, p. 177; Melander & Sahlström, 2009). In Norway, The Linking Instruction and Student Achievement (LISA) study is the largest of its kind using videos from 50 schools in research on the effect of different classroom instructions on students learning in mathematics and Norwegian language arts (Department of Teacher Education and School Research, n.d.). In recent years, researchers in HE education in Sweden and Finland, which both have subjects similar to Norwegian FH, have also used a video-based approach when conducting classroom research (Bohm et al., 2015, 2016; Gelinder et al., 2020; Haapaniemi et al., 2019; Lindblom et al., 2016). Video recordings enable us to capture social interaction in detail, as it captures both verbal and non-verbal communication (Kristensen, 2018). In contrast to observation, videos can be viewed as needed for analysis and easily shown to members of a research group for collaborative work and discussion. Further, video recordings can be used for a variety of interests and analytic approaches (Heath

et al., 2017). Hence, video recording was regarded as the most suitable approach for data collection.

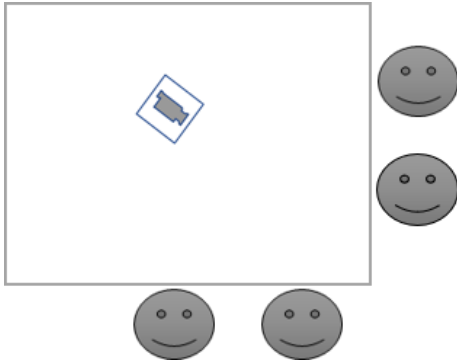


Figure 1. Layout of student and camera placement.

Immediately after each class, short follow-up FGDs were conducted by the first author, with the FH teachers and assistants in one group and students in another. These are included in the results section for reference.

Data analysis

Given the clear research questions which was based on SCL theory, a deductive approach (Derry et al., 2010, p. 10) to data selection was conducted. The recorded material was watched several times by the first author of this paper to get an initial overview. After finding several initial episodes considered relevant for the research questions, some of the material was watched and discussed with the co-authors to help with episode selection. The field notes written during data collection were also reviewed. Both student-student interaction and student-teacher/assistant interactions were regarded as valuable since they capture social interaction and dialogue. Students' questioning and discussions within their groups were considered especially interesting since this stimulates collaborative thinking. Hence, these aspects were included when analysing the episodes and presenting the data.


Quotations and drawings of still frames (to protect personal data) from the video recordings are included to illustrate findings where students and teachers work together and use language to bring the tasks further. Information added by the first author is inserted in brackets in the transcriptions for clarification.


Results

How do the learning tasks support student interaction and dialogue?

In episode 1a, three students found it difficult placing the picture of the slice of bread with brown cheese (a traditional Norwegian cheese often made of a mix of goat's and cow's milk, whey, and cream) and tomatoes on the side. One of the students believed they should only look at the bread with brown cheese and not include the tomatoes when evaluating. This was easily clarified by asking the research assistant, who helped them along in their discussion (Table 2). One of the students asked the others if there were any sugar in bread, whereby both classmates affirmed that there was. After student 3 mentioned that there was sugar in the cereal as well, the students finally agreed on how to arrange the two pictures.

Table 2. Findings and description of the picture ranking learning tasks. S= students, A=assistant

Activity	Group and time	Quotes
Picture ranking	<p>Episode 1a, group 2. Assistant standing second to the left in the picture.</p> 	<p>Three students are trying to agree on where to put the bread with brow cheese and whether the tomatoes in the picture also counts.</p> <p><i>S1: "I think they just mean the slice of bread with brown cheese."</i> <i>S2: "But why would they put them [the tomatoes] there if not?" [reaches out to the teacher] ... "Do they mean just the slice with brown cheese or the tomatoes as well?"</i> <i>A: "It's everything in the picture."</i> <i>S1: "Ah, okay..."</i> <i>S2: "Yes, because that's just Havrefras [Norwegian wholemeal cereal]... I don't think there is a lot of sugar in. [points to the slice of bread]"</i> <i>S3: "There is sugar in that one. [bread]"</i> <i>S2: "Is there any sugar in bread?"</i> <i>S1: "Ahh... yes, I think so."</i> <i>S3: "There is sugar in bread."</i> <i>S1: "White bread and stuff like that, they contain a lot of sugar."</i> <i>[Short pause]</i> <i>S3: But there is sugar in that one [Havrefras]also.</i> <i>S2: Okay, so should we put them like this, and then see?</i> <i>S3: Yes.</i> <i>S1: Okay.</i></p>



Picture ranking	Episode 1b, group 1. 	Student (in the middle of the picture, laying his head down onto the desk) getting bored at the end of the class discussion, which lasts for approximately 15 minutes. The aim of the review was to go through each picture and rank them in dialogue with the students.
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All three students in episode 1a were involved in the task and attempted to solve the task through dialogue within the group and including the assistant where necessary. This interaction and dialogue helped the students further in their work with the task. However, in some groups, one or two students in the group were more dominating and took control of the activity, leaving the others more passive. Further, when an activity was finished fast, sometimes without any discussion between the students, the students began talking about off-topic matters until their attention was called again by the assistants or FH teacher.

In episode 2a (Table 3), the students were surprised by how much their selected fruit and vegetable weighed. This indicates that they knew that five portions should equal 500 grams (according to the dietary guidelines). As their FH teacher, by chance, approached at that time and heard the students wondering, she asked if they eat everything of what they had selected. One of the boys quickly realises that they do not eat the peel. This made it clear that the recommended amount is the actual consumed amount, not the total weight. Later, they were equally surprised to see how much peel there was. After removing the peel and the potato, which is not part of the “5 a day” recommendation, the students were eventually close to 500 g.

Table 3. Findings and description of the “5 a day” learning tasks. S = students, T = FH teacher

Activity	Group and time	Quotes
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<p>5 a day</p>	<p>Episode 2a, group 3.</p> <p>Teacher standing to the right in the picture</p> 	<p>The students are surprised by how much their five fruits and vegetables weigh, indicating that they know it is supposed to be around 500 g.</p> <p><i>S1: "How is that...?"</i></p> <p><i>S2: "731 [grams]. Let us take them out and put them back in again."</i></p> <p><i>T: "But now you must remember; do you eat everything on the fruits selected here?"</i></p> <p><i>S2: "Nooo!"</i></p> <p><i>T: "Right? So you might not be too far off... some of it you need to peel off."</i></p>
<p>5 a day</p>	<p>Episode 2b, group 3.</p> 	<p>Three students are playing with the scale and the fruit and vegetables during the review of the assignment with the teacher.</p>

At the end of both learning tasks 1 and 2, some students found it difficult to concentrate during the class discussions where the assistant did the majority of the talking. This resulted in some students withdrawing from the activity (episode 1b), becoming distracted, and focusing on off-topic matters (episode 2b).

How do the learning tasks create opportunities for communication and collaboration between students?

In learning tasks 1 and 2, the students were placed in small groups to facilitate communication and collaboration within each group. The teacher introduced and explained the activity before the students were encouraged to solve the task collaboratively. In learning task 1, the students communicated and solved the task collaboratively. As the students worked, both the assistants and the FH teacher were always available to answer any questions the students might have had. Also, the FH teachers and assistants occasionally listened to the conversations and asked follow-up questions to promote communication within the groups. At the beginning of learning task 2 ("5 a day"), the group as a whole was asked to get the amount they believed

was the recommended amount, providing the opportunity to come to an agreement collaboratively.

However, not all students were always as eager to talk and involve themselves in the different tasks. Further, if some of the groups finished the tasks too quickly due to little communication and collaboration, the students spent their collaboration time talking about off-topic matters, or the assistants talked more themselves. Hence, the activating learning task provided communication and collaboration opportunities, but it was not utilised to the fullest. This, in turn, can affect learning outcomes.

When different tools (fruits, vegetables, scale, markers, pictures, a calculator, etc.) were available to students, the tools quickly became a distraction. In episode 2b, the students focused on the fruit and scales rather than focusing on the teacher. This happened in most of the groups, both when they were working themselves and during the teacher-led class discussion. Hence, the teachers need to be aware of how this may affect students' learning activities.

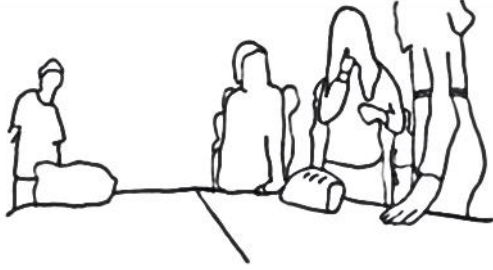

How do the learning tasks support students' abilities to listen and argue?

In learning task 1, the students were explicitly instructed to argue for their opinion of which order the pictures should be placed. In episode 1a, the students listened to what each had to say without interrupting. They built on each other's ideas, indicating that they listened and followed up on each other's comments and opinions. Some of the students could give reasons and argue for their opinion based on their dietary knowledge about the different products, but many did not or could not. In most of the groups, the students seemed certain about their statements but struggled to explain why when asked to elaborate.

In episode 3a (Table 4), the students were asked to explain why they believed the bread presented was wholemeal or not (learning task 3). By purpose, the wholemeal bread was quite light in colour and contained no visible grains, whereas the white bread was covered in grains and was darker in colour than typical white bread. All students based their judgement on the bread appearance, and the assistant follows by asking for elaboration on what way the bread looked healthy. The students did not know the two breads' nutritional value, resulting in most students guessing wrong. The students were stunned to see the correct answer, as they were quite confident in their ability to recognise a wholemeal bread by merely looking at it. Finally, the assistant explained why it is difficult to judge bread based on its look and why food labelling like the "bread scale" (a labelling that shows the percentage of whole grains,

wholemeal flour and bran in bread) can be a valuable tool when looking for the healthier option.

Table 4. Findings and description of the line game learning tasks. S = students, A = assistant.

<p>Line game</p>	<p>Episode 3a, group 2.</p> 	<p>The assistant asks the students to explain their reasoning for judging the bread as being whole grain:</p> <p><i>A: "The majority have placed themselves at whole grain. Why do you think it is whole grain?"</i></p> <p><i>S1: "It [the bread] looks like it"</i></p> <p><i>A: "It looks like it. Yes, it has grains on top of it and... mhm. you have placed yourselves at 50% whole grain?"</i></p> <p><i>S2: "I think it looks a bit light/pale."</i></p> <p><i>A: "Yes. And you at the top [at extra whole grain]. What do you think?"</i></p> <p><i>S3: "Ehm, it looks really healthy."</i></p> <p><i>A: "Mhm, it looks healthy. Lots of grains both inside and on top of it."</i></p>
<p>Line game</p>	<p>Episode 3b, group 1.</p> 	<p>Some students getting passive and unfocused (sitting or lying down on the desk) during the assignment with agree/disagree questions.</p>

Learning task 3 also included different statements, like “fresh vegetables are healthier than frozen vegetables”, where the students had to place themselves at a scale from agree to disagree, and then argue why they believe so before the assistant provided an answer with an explanation. The students needed to pay attention to the statement presented before thinking and deciding for themselves. If there were too many statements presented and the activity lasted too long, some students eventually lost interest (episode 3b).

During the FGDs with the students after the class, the overall feedback was that the students found the class engaging and fun. More specifically, they appreciated that the activities were practical, indicating that the learning tasks activated the students, as planned in the design. This was also supported by the FH teachers, who believed this is a good way to work with the theory. The FH teachers mentioned that these learning tasks were something they could easily

use themselves in their teaching. The feedback from the FGDs with the teachers and assistants after the first testing (school 1), which resulted in minor adjustments regarding the line game, was not mentioned in school 2, indicating that it worked better.

Discussion

This study aimed to explore how the three student-activating learning tasks developed in the LifeLab project can contribute to active learning among students during FH lessons by taking a sociocultural approach to learning and building on skills important in social learning and development (Directorate for Education and Training, 2019a, p. 10).

We found that the learning tasks facilitated various aspects relevant to social learning by adapting a sociocultural approach (John-Steiner & Mahn, 1996; Vygotsky, 1978). Through this approach, which emphasises social interaction and dialogue, the learning tasks can help students reach the different competency aims in FH listed in table 1 and oral skills as described in the new FH curriculum (Directorate for Education and Training, 2019b).

The learning tasks required the students to interact and discuss with each other and be self-driven to complete the tasks successfully. However, when the students finished their tasks fast, some started talking about off-topic matters. Since language is an educational tool and a tool for problem-solving (Mercer, 2013; Säljö, 2001), the main challenge for teachers and teacher education is how to design and provide student-activating learning tasks, where dialogue, discussion, and constructive argumentation have a central role. One challenge here could have been that the assistants did not know the students beforehand and had a fixed schedule to adhere to. In any other classroom situation, the FH teachers could move along at a natural breaking point. Since there is no “one-size-fits-all” in education with every student being unique, it could be beneficial for the FH teachers to be included in creating the tasks. In knowing the students, he/she would be able to tailor the tasks in order to meet the needs of the students better.

In these episodes, learning task 1 especially created opportunities for students to communicate and collaborate. When both the assistants and the FH teacher engaged in scaffolding by asking follow-up questions to the groups continuously during the class, it was valuable for engaging the students and getting them to talk and clarifying possible misunderstandings that could limit their discussions. Hence, the scaffolding provided by interacting with the students helped the students in their ZDP, supporting them in their learning process and widening their body of knowledge (Vygotsky, 1978). This importance of talk and language for learning

aligns with sociocultural learning and collective thinking (John-Steiner & Mahn, 1996; Mercer, 2013; Vygotsky, 1978). During the students' collaborative work and thorough the class discussion after students had ranked all the pictures, the assistant included all students in the collaborative process of arranging them on the whiteboard. Here, it was emphasised that there is not a simple right or wrong answer. By facilitating discussions regarding the nutritional content and value of each picture and relating this to the national guidelines, the FH curriculum's competency goal listed in Table 1 and the development of oral skills was targeted. Also, since there were differences in the student's nutritional knowledge, this process most likely added to their understanding of the different items' nutritional value.

Although the students working with learning task 1 worked in groups and were explicitly told to listen, argue for their opinions, discuss together to come to agreements, these activities were not evident in all groups. Some students only presented statements, such as "that one is healthier than that one" without giving a reason or discussing it with their peers. Further, in our study, few other students asked "why" one is more or less healthy. Hence, the students could listen and argue, but not all students did so. In these cases, it was especially valuable to go through the pictures together with the whole class, so everyone was included in understanding the "why". This phenomenon has also been discovered when analysing children's collaboration and argumentation skills in group discussions in a science class (Maloney & Simon, 2006). Here, the researchers found low levels of collective thinking during group discussions. The children merely took turns in talking, with low levels of argumentation, which is following our findings. Therefore, teachers need to help children learn how to work in a group and develop their cooperation and argumentation skills (Gillies, 2003; Maloney & Simon, 2006). Correspondingly, after studying interthinking among 7th graders in HE, Taar (2017) proposes that in order for students to interthink (Littleton & Mercer, 2013), teachers must remind the students to explain their understanding to each other.

One picture in learning task 1 was fruit yoghurt, but some students believed it was ice cream. Although this was clarified during the task, either within the groups or telling the class aloud, the teacher could have clarified this in the very beginning. Also, the teachers did not clearly state each activity's learning goal, which could have helped the students understand the purpose and hence impact their learning outcome.

In learning task 2, the students explored how much "5 a day" was by weighing their selected amount and reducing or adding to reach 500 grams. The different fruits and vegetables served as tools for learning (See Vygotsky, 1978), by exemplifying the recommended amount.

Through dialogue with the FH teacher, the students in episode 2a were able to clarify the confusion of the weight of what they had collected. This highlights the importance of teacher-student interaction in classrooms. Although the task did not require much dialogue, it provided students with a visual of the actual amount of fruit and vegetables recommended each day, making the recommended amount of 500 grams maybe seem less abstract. It was also a convenient chance to clarify the “5 a day” recommendation from the health authorities. During the line game (learning task 3), the most successful task was the initial use of the two pieces of bread. Having the bread available for the students to examine seemed to engage the students to a greater extent compared to when only a statement was presented. Also, the students’ reaction to seeing how difficult it was to judge a bread solely by appearance was noticeable. The bread could be viewed as a pedagogical tool (Säljö, 2001; Vygotsky, 1978). However, as the students were examining the bread, the assistants could have encouraged them to examine its weight and taste before making their decision. Further, when the assistant described the two bread's look for the students, this worked counterproductively. Preferably the descriptions would have been left to the students themselves. Despite this, the assistant might have served as an example of how one can describe thoughts. By discussing the bread scale examined here and including statements regarding fresh and frozen vegetables, the activities could target the competency aim relating to industrially processed food and product information as listed in table 1.

When working with food and health, there is a chance of becoming too normative as to what is the “right” or “wrong” thing to eat (Gelinder, 2020). Hayes-Conroy and Hayes-Conroy (2013) call this approach “hegemonic nutrition”, a reductionist and hierarchical way of looking at nutrition, leaving out essential diversities like food culture, preferences and ethics, to mention some. In the first testing, the assistants asked the students to rank the pictures from what they believed was the least to most healthy. This was chosen because “healthy food” was regarded as something the students could easily relate to. However, this was changed to least to most nutritious in the second class. This was considered more appropriate, as it has a lower emphasis on “yes” and “no” food and focuses more on the complexity of food. Interestingly, although groups 2 and 3 were asked to rank the pictures based on most/least nutritious, many students consistently used the words healthy and unhealthy, indicating that this dichotomic phrasing comes naturally to the student when talking about food. Ultimately, the goal of the discussion with the assistants was for the students to see there is no simple right or wrong way to rank the different dishes and food items.

The students had quite strong statements about whether something was healthy or not. However, few students explained why this was the case. Each item's sugar content was most often used as a premise for something being healthy or not. It is worth mentioning that in groups 1 and 2, some of the food items were included in a learning task where the students measured the sugar content. They also saw a short video clip about sugar in various beverages, which most likely guided their thinking. This narrow focus on sugar indicates a generally low level of nutritional knowledge among some of these students. In episode 1, the students focus on sugar content, but they do not distinguish between natural and added sugar nor fibre, which is relevant to the pictures they are discussing. They only use the word “sugar”, not taking the discussion further by talking about different carbohydrates, indicating an inability to see food and nutrition complexities. It may have been better for the discussions if the students had more knowledge about the different food items before the task, so they had more knowledge to share within their group. The students' ability to discuss and argue may also not be adequately evolved, as this is something teachers need to help the students to develop (Gillies, 2003; Maloney & Simon, 2006). This makes the class discussion after the picture ranking activity even more important, as it can add to the student’s knowledge and understanding of the complexity of food.

Methodological and ethical considerations

Several conditions may have affected how these learning tasks worked in the three classrooms explored in this study. Although the FH teacher was present during the class, the two assistants, who conducted the teaching, were new to the students, as was the researcher passively observing the classes. The assistants and the researcher had only greeted the students once when they made a short visit to the schools before data collection. Also, only one of the three assistants was a trained teacher, which can affect the classroom environment and management. Usually, there would also be only one teacher present, not three, as in this study.

If the FH teacher could have helped develop the activities or the activity developers had known the students before data collection, the activities could have been tailored to each class and each student’s strengths and weaknesses, e.g. nutritional knowledge and group dynamic. Still, the FH teachers placed the students in the same groups they are usually in during a regular FH class, so the students were comfortable working together. The learning tasks were

also developed based on suggestions from both FH students and teachers who participated in the FGDs conducted earlier in the project.

Using video to collect and analyse data has its strengths and limitations. Having one wide-angled camera placed at each desk made it possible to see and hear each student. However, at school 1, the cameras were placed too far away, making it difficult and sometimes even impossible to hear what the students said. Consequently, these sections were impossible to analyse. Therefore, at school 2, the cameras were placed closer to the students, resulting in much better sound quality. Using video cameras to collect data from the classroom settings always includes the possibility of students not acting naturally because of the recording (Bloor & Wood, 2006). Despite the cameras being placed quite near the students, most students seemed not to be bothered or restricted by them. One reason for this might be that the cameras used in this study were quite small and were not moved around in the classroom. The students ignored them during the learning activities, except when one of the cameras stopped recording and it had to be turned on again. Even after this, the students quickly started working on the tasks again. Also, to increase the trustworthiness of the findings, the co-authors participated in the selection of episodes.

To ensure data protection, we distributed and collected written parental consent from all participating students, which were outlined per the Norwegian Centre for Research Data. Also, permission to include quotes or still frames that were edited so it would not be possible to recognise the students were specified in the information sheets. Still, we only included drawings of still frames to protect personal data since there is a possibility to convert filtered or otherwise edited pictures back to the original form.

Conclusion and further work

This study evaluated students-activating learning tasks developed in the LifeLab Food and Health project, relating to some theoretical aspects of the FH curriculum. By taking a sociocultural approach to learning and building on the skills related to social learning and development, the three student-activating learning tasks investigated here can be valuable in future work concerning the FH syllabus in the future. Although the competency aims included here will change by the end of this year, we believe the activities are equally relevant for the new FH curriculum, valid as of autumn of 2020. We found students enjoyed being active during class and the FH teachers found the practical aspect of the LifeLab tasks beneficial. In today's FH classes, the emphasis is primarily on cooking and developing and mastering

practical cooking skills. Although students can practice all skills related to social learning investigated here during cooking, these skills can also be valuable to incorporate when working with the subject's more theoretical content. We propose a need for more practical approaches to theory and more theoretical content linked to the practical work of cooking.

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Appendix I

Ethics approval

Søknad om etisk godkjenning av forskningsprosjekt

Godkjenner: Anne Valen-Sendstad Skisland

Tidspunkt for godkjenning: 25/10/2018 22:04:50

Vi informerer om at din søknad er ferdig behandlet og godkjent.

Kommentar fra godkjenner:

25/10/2018 22:04:44 - Anne Valen-Sendstad Skisland (Comments)

Din søknad om etisk godkjenning av prosjektet "LifeLab mat og helse" er godkjent under forutsetning av gjennomført som beskrevet i søknaden. Lykke til! På vegne av FEK

Anne V-S Skisland

Frøydis Nordgård Vik
Serviceboks 422
4604 KRISTIANSAND S

Vår dato: 09.03.2018

Vår ref: 59097 / 3 / LH

Deres dato:

Deres ref:

Vurdering fra NSD Personvernombudet for forskning § 31

Personvernombudet for forskning viser til meldeskjema mottatt 09.02.2018 for prosjektet:

<i>59097</i>	<i>LifeLab Mat og helse – innovativ undervisning for fremtidens skole</i>
<i>Behandlingsansvarlig</i>	<i>Universitetet i Agder, ved institusjonens øverste leder</i>
<i>Daglig ansvarlig</i>	<i>Frøydis Nordgård Vik</i>

Vurdering

Etter gjennomgang av opplysningene i meldeskjemaet og øvrig dokumentasjon finner vi at prosjektet er meldepliktig og at personopplysningene som blir samlet inn i dette prosjektet er regulert av personopplysningsloven § 31. På den neste siden er vår vurdering av prosjektopplegget slik det er meldt til oss. Du kan nå gå i gang med å behandle personopplysninger.

Vilkår for vår anbefaling

Vår anbefaling forutsetter at du gjennomfører prosjektet i tråd med:

- opplysningene gitt i meldeskjemaet og øvrig dokumentasjon
- vår prosjektvurdering, se side 2
- eventuell korrespondanse med oss

Vi forutsetter at du ikke innhenter sensitive personopplysninger.

Meld fra hvis du gjør vesentlige endringer i prosjektet

Dersom prosjektet endrer seg, kan det være nødvendig å sende inn endringsmelding. På våre nettsider finner du svar på hvilke [endringer](#) du må melde, samt endringskjema.

Opplysninger om prosjektet blir lagt ut på våre nettsider og i Meldingsarkivet

Vi har lagt ut opplysninger om prosjektet på nettsidene våre. Alle våre institusjoner har også tilgang til egne prosjekter i [Meldingsarkivet](#).

Vi tar kontakt om status for behandling av personopplysninger ved prosjektslutt

Ved prosjektslutt 01.12.2022 vil vi ta kontakt for å avklare status for behandlingen av personopplysninger.

Dokumentet er elektronisk produsert og godkjent ved NSDs rutiner for elektronisk godkjenning.

Se våre nettsider eller ta kontakt dersom du har spørsmål. Vi ønsker lykke til med prosjektet!

Marianne Høgetveit Myhren

Lise Aasen Haveraaen

Kontaktperson: Lise Aasen Haveraaen tlf: 55 58 21 19 / Lise.Haveraaen@nsd.no

Vedlegg: Prosjektvurdering



UTVALG OG REKRUTTERING

Utvalget består av rektor og lærere i grunnskolen, samt studenter, og elever under 15 år. Forskerne tar direkte kontakt med rektorer ved alle skoler i Norge. Rektorene videresender informasjon til aktuelle mat og helse-lærere, som videreformidler informasjon om prosjektet til skoleelever og deres foreldre. I tillegg blir det lagt ut informasjon om prosjektet i sosiale medier.

Studentene mottar informasjon om prosjektet i undervisningssituasjon ved universitetet.

METODE

Data samles inn gjennom elektronisk spørreskjema, personlig intervju og gruppeintervju.

INFORMASJON OG SAMTYKKE

Dere har opplyst i meldeskjema at utvalget vil motta skriftlig og muntlig informasjon om prosjektet, og samtykke skriftlig til å delta. Foreldre samtykker til deltakelse på vegne av barn under 15 år. Vår vurdering er at informasjonsskrivene til utvalget stort sett er godt utformet, men vi ber om at informasjon om at opplysningene anonymiseres ved prosjektslutt legges til i alle skrivene. I tillegg må dato for prosjektslutt og kontaktopplysninger legges til i skrivet til elevene.

I meldeskjema er det krysset av for at det registreres personopplysninger (IP-adresse/epost) ved hjelp av nettbaserte spørreskjema. Vi ber derfor om at følgende setning endres i informasjonsskrivene til spørreundersøkelsen: "Undersøkelsen er anonym og det vil ikke være mulig å identifisere deg i resultatene av studien når disse publiseres". Dette fordi IP-adresse/epost-adresse kan være sporbart, og undersøkelsen er dermed ikke anonym.

BARN I FORSKNING

Deler av utvalget i prosjektet er barn og unge under 15 år, og det er foreldrene deres som samtykker til deltakelse. Det er viktig at barna og ungdommene får informasjon om at de kan velge å ikke delta i prosjektet hvis de ønsker det, selv om foreldrene har samtykket.

TAUSHETSPLIKT

Rektorer og lærere har taushetsplikt. Personvernombudet forutsetter at det ikke innhentes personopplysninger om enkeltelever eller ansatte ved skolen, og at taushetsplikten ikke er til hinder for den behandling av opplysninger som finner sted.

INFORMASJONSSIKKERHET

Personvernombudet forutsetter at dere behandler alle data i tråd med Universitetet i Agder sine retningslinjer for datahåndtering og informasjonssikkerhet. Vi legger til grunn at bruk av mobil lagringsenhet er i samsvar med

institusjonens retningslinjer.

DATABEHANDLER

Dere har opplyst i meldeskjema at SurveyXact benyttes som databehandler i prosjektet. Dersom det ikke allerede eksisterer en databehandleravtale mellom Universitetet i Agder og databehandleren, skal det inngås en skriftlig avtale om hvordan personopplysninger skal behandles, jf. personopplysningsloven § 15. For råd om hva databehandleravtalen bør inneholde, se Datatilsynets veileder: <https://www.datatilsynet.no/regelverk-og-skjema/veiledere/databehandleravtale/>

PROSJEKTSLUTT OG ANONYMISERING

Prosjektslutt er oppgitt til 01.12.2022. Det fremgår av meldeskjema at dere vil anonymisere datamaterialet ved prosjektslutt. Anonymisering innebærer vanligvis å:

- slette direkte identifiserbare opplysninger som navn, fødselsnummer, koblingsnøkkel
- slette eller omskrive/gruppere indirekte identifiserbare opplysninger som bosted/arbeidssted, alder, kjønn
- slette lydopptak

For en utdypende beskrivelse av anonymisering av personopplysninger, se Datatilsynets veileder: <https://www.datatilsynet.no/globalassets/global/regelverk-skjema/veiledere/anonymisering-veileder-041115.pdf>

Personvernombudet gjør oppmerksom på at også databehandler må slette personopplysninger tilknyttet prosjektet i sine systemer. Det inkluderer eksempelvis transkripsjoner, filer, logger og koblingsnøkkel mellom IP-/epostadresser og besvarelsene.

Appendix II

Questionnaire

Takk for at du tar deg tid til å svare på denne spørreundersøkelsen. Dine svar er svært viktig for oss, og vi setter stor pris på din deltakelse!

Undersøkelsen vil ta ca. 10 minutter.

Alle data er anonyme og vil kun bli brukt til prosjektets formål og av personer tilknyttet forskningsprosjektet. Ved å svare på spørreundersøkelsen samtykker du til deltakelse.

Du kan når som helst bruke knappene nedenfor til å navigere deg frem og tilbake i undersøkelsen, men alle spørsmål må være besvart før du kan gå videre til neste.

Trykk på "neste" for å komme i gang.

Med vennlig hilsen

Cecilie Beinert

Stipendiat, LifeLab Mat og Helse



Fakultet for helse- og idrettsvitenskap,
Universitet i Agder

Bakgrunn

1. Kjønn

- (1) Kvinne
(2) Mann

2. Hva er din alder?

- (10) 18-21
(1) 22-25

- (2) 26-30
- (3) 31-35
- (4) 36-40
- (5) 41-45
- (6) 46-50
- (7) 51-55
- (8) 56-60
- (9) >60

3. Hva er din utdanning i mat og helse?

- (1) Allmennlærer uten mat og helse i fagporteføljen
- (11) Allmennlærer med 15 stp/5 vt mat og helse
- (2) Allmennlærer med 30 stp/10 vt mat og helse
- (3) Allmennlærer med 60 stp/20 vt mat og helse
- (4) Halvårsenhet i mat og helse (30 stp) uten lærerutdanning
- (6) Årsenhet i mat og helse (60 stp) uten lærerutdanning
- (5) Husstellærer
- (7) Kokk
- (8) Restaurant og matfag (videregående)
- (9) Ufaglært/assistent
- (10) Annet _____

4. I hvor mange år har du jobbet som mat og helse-lærer (inkl. heimkunnskapslærer)?

- (1) <1 år
- (2) 1-5 år
- (3) 6-10 år
- (4) 11-15 år
- (5) 16-20 år
- (6) 21-25 år
- (7) 26 år eller mer

5. Hvilke årstrinn underviser du mat og helse på? Du kan velge flere svaralternativer

- (1) 1. trinn
- (6) 2. trinn
- (7) 3. trinn
- (8) 4. trinn

- (9) 5. trinn
- (10) 6. trinn
- (11) 7. trinn
- (12) 8. trinn
- (13) 9. trinn
- (14) 10. trinn

Rammer rundt mat og helse-undervisningen

6. Hvor stor andel av undervisningen i mat og helse går til praktisk matlaging?

- (2) 90-100% av tiden
- (7) 80-90% av tiden
- (3) 70-80% av tiden
- (4) 50-70% av tiden
- (5) 30-50% av tiden
- (6) Mindre enn 30% av tiden

7. I hvilken grad føler du at du behersker arbeidsoppgavene dine i mat og helse-undervisningen?

- (1) I svært stor grad
- (3) I stor grad
- (4) I noen grad
- (5) I liten grad
- (6) I svært liten grad

8. Hvor tilfreds er du med å undervise i faget?

- (5) Svært tilfreds

- (4) Tilfreds

- (6) Hverken eller
- (2) Lite tilfreds

- (1) Svært lite tilfreds

9. Hvilke faktorer mener du kan hindre god mat og helse-undervisning?

	Svært viktig	Viktig	Vet ikke	Uviktig	Ikke viktig i det hele tatt
Få timer til faget	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
Få lærere med fagutdanning	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
Dårlige undervisningslokaler	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
Mangel på utstyr	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
Fagets status	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
Økonomiske	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
En ledelse som ikke "spiller på lag"	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
Samarbeidsproblemer med kollegaer	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
Timeplanlegging	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>

10. Hvor viktig mener du at følgende momenter er for god læring i mat og helse?

	Svært viktig	Viktig	Vet ikke	Uviktig	Ikke viktig i det hele tatt
Engasjerte lærere	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
Motiverte elever	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
Varierte undervisningsmetoder	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
Mye praktisk matlaging	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
Mye teoretisk undervisning	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
En kombinasjon av praktisk og teoretisk undervisning	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
God økonomi i faget	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
Gode undervisningslokaler	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
Nødvendig utstyr	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>
Lærere med fagutdanning	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>

11. I hvilken grad opplever du at mat og helse blir sett på som et samfunnsnyttig fag?

- (1) I svært stor grad
(6) I stor grad
(2) Vet ikke
(4) I liten grad

(5) Ikke i det hele tatt

12. I hvilken grad inkluderer du de følgende fem grunnleggende ferdighetene i din mat og helse-undervisning?

	I svært stor grad	I stor grad	I noen grad	I liten grad	I svært liten grad
Å kunne uttrykke seg muntlig	(1) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
Å kunne uttrykke seg skriftlig	(1) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
Å kunne lese	(1) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
Å kunne regne	(1) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
Å kunne bruke digitale verktøy	(1) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>

Mat og helse som helsefremmende fag

13. I hvilken grad opplever du at mat og helse-undervisningen bidrar positivt på elevenes kunnskap om mat og helse?

- (1) I svært stor grad
(6) I stor grad
(2) Vet ikke
(4) I liten grad

(5) Ikke i det hele tatt

14. I hvilken grad opplever du at mat og helse-undervisningen bidrar positivt til utvikling av elevenes praktiske ferdigheter i mat og helse?

- (1) I svært stor grad
- (6) I stor grad
- (2) Vet ikke
- (4) I liten grad

- (5) Ikke i det hele tatt

15. I hvilken grad opplever du at mat og helse-undervisningen bidrar til positive holdninger til kosthold og helse generelt?

- (1) I svært stor grad
- (6) I stor grad
- (2) Vet ikke
- (4) I liten grad

- (5) Ikke i det hele tatt

16. I hvilken grad anser du mat og helse-lærere som ressurspersoner i det helsefremmende og forebyggende arbeidet blant elever?

- (1) I svært stor grad
- (6) I stor grad
- (2) Vet ikke
- (4) I liten grad

- (5) Ikke i det hele tatt

17. I hvilken grad styrer de nasjonale kostrådene hvilke retter dere lager på kjøkkenet?

- (1) I svært stor grad
- (3) I stor grad
- (4) I noen grad
- (5) I liten grad
- (6) I svært liten grad

Undervisningsmetoder

18. Hvilke av følgende undervisningsmetoder bruker du i din mat og helse-undervisning? Du kan velge flere svaralternativer

- (3) Utforskende/eksperimentell undervisning
- (4) Undervisning med bruk av digitale hjelpemidler
- (5) Undervisning der elevene oppfordres til å bruke sine sanser
- (8) "Flipped classroom"
- (7) Bruker ingen av disse metodene

19. I gjennomsnitt, hvor ofte benytter du deg av disse undervisningsmetodene i mat og helse?

	Hver mat og helse- time	1-2 ganger pr måned	Sjeldnere enn 1 gang per måned	Aldri
Utforskende/eksperimentell undervisning	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(6) <input type="checkbox"/>	(7) <input type="checkbox"/>
Digitale hjelpemidler	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(6) <input type="checkbox"/>	(7) <input type="checkbox"/>
Undervisning der elevene oppfordres til å bruke sine sanser	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(6) <input type="checkbox"/>	(7) <input type="checkbox"/>
"Flipped classroom" (elevforberedt undervisning)	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(6) <input type="checkbox"/>	(7) <input type="checkbox"/>

20. Er det noen av disse undervisningsmetodene du gjerne skulle brukt mer av i din mat og helse- undervisning?

	Ja	Nei
Utforskende/eksperimentell undervisning	(2) <input type="checkbox"/>	(8) <input type="checkbox"/>
Digitale hjelpemidler	(2) <input type="checkbox"/>	(8) <input type="checkbox"/>
Undervisning der elevene oppfordres til å bruke sine sanser	(2) <input type="checkbox"/>	(8) <input type="checkbox"/>
"Flipped classroom" (elevforberedt undervisning)	(2) <input type="checkbox"/>	(8) <input type="checkbox"/>

21. Hvorfor benytter du deg av disse undervisningsmetodene? Du kan velge flere svaralternativer

	Elevene etterspør det	Jeg mener det fremmer læring	Jeg mener det fremmer motivasjo n blant elevene	Jeg mener det fremmer skaperlyst en blant elevene	For å varierte undervisni ngen	For å fremme samarbeid mellom elevene	Annet
Utforskende/eksperimentell undervisning	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(6) <input type="checkbox"/>	(7) <input type="checkbox"/>	(8) <input type="checkbox"/>	(5) <input type="checkbox"/> _____
Digitale hjelpemidler	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(6) <input type="checkbox"/>	(7) <input type="checkbox"/>	(8) <input type="checkbox"/>	(5) <input type="checkbox"/> _____
Undervisning der elevene bruker sine sanser	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(6) <input type="checkbox"/>	(7) <input type="checkbox"/>	(8) <input type="checkbox"/>	(5) <input type="checkbox"/> _____
"Flipped classroom"	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(6) <input type="checkbox"/>	(7) <input type="checkbox"/>	(8) <input type="checkbox"/>	(5) <input type="checkbox"/> _____

22. Hvorfor benytter du deg eventuelt ikke av en eller flere av disse undervisningsmetodene? Du kan velge flere svaralternativer

	Det krever for mye arbeid av meg	Har ikke godt nok lokale	Er ikke er trygg nok på gjennomfø ringen	Elevene jobber ikke like godt i grupper	Elevene lærer best ved å lytte	Ikke relevant/b enyttet meg allerede av undervisni ngen	Annet
Utforskende/eksperimentell undervisning	(1) <input type="checkbox"/>	(4) <input type="checkbox"/>	(7) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(6) <input type="checkbox"/>	(8) <input type="checkbox"/> _____
Digitale hjelpemidler	(1) <input type="checkbox"/>	(4) <input type="checkbox"/>	(7) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(6) <input type="checkbox"/>	(8) <input type="checkbox"/> _____
Undervisning der elevene oppfordres til å bruke sine sanser	(1) <input type="checkbox"/>	(4) <input type="checkbox"/>	(7) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(6) <input type="checkbox"/>	(8) <input type="checkbox"/> _____
"Flipped classroom" (elevforberedt undervisning)	(1) <input type="checkbox"/>	(4) <input type="checkbox"/>	(7) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(6) <input type="checkbox"/>	(8) <input type="checkbox"/> _____

Fornyelse av mat og helse?

23. Mener du at faget trenger å fornyes?

- (1) Nei, det fungerer fint som det er i dag
- (3) Ja, det er på tide med en fornying

24. På hvilke områder mener du faget trenger å fornyes? Du kan velge flere svaralternativer

- (1) Undervisningsmetoder
- (2) Kompetansemålene
- (3) Innholdet i undervisningen
- (5) Utdanningen av mat og helse-lærere
- (4) Flere timer til faget
- (6) Færre timer til faget
- (8) Annet _____

25. Hvor fikk du informasjon om denne undersøkelsen fra?

- (1) Rektor (evt. annen leder)
- (7) Tidsskriftet "Mat og helse i skolen"
- (4) Facebook-siden "Landslaget for mat og helse i skolen (LMHS)"
- (10) Facebook-siden "Mat og helse-lærerne- vi deler undervisningstips"
- (9) Kollega
- (8) Annet _____

Takk for at du svarte på undersøkelsen!

Trykk på "Avslutt" for å lagre dine svar.

Med vennlig hilsen

Cecilie Beinert
Stipendiat, LifeLab Mat og Helse



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Universitet i Agder

Appendix III

Topic guides

Intervjuguide elever

Åpning

- Ønsker velkommen
- Fortelle kort om meg og hva jeg skal gjøre
- Forteller om målet med intervjuet, litt om tid og type spørsmål
 - viktig å utdype at det er mat og helse!
- Info om taushetsplikt, opptak, anonymitet etc.
- Info om ingen riktige eller gale svar
- Spørre om de har noen spørsmål før vi setter i gang
- Starte opptak

• Si hvilket klassetrinn som intervjues

- Hva synes dere om mat og helse- faget? (2 min)
 - Hva er det beste med mat og helse? Hvorfor?
 - Når lærer du best?
 - Hva liker dere å gjøre i timen? (Hva er det viktigste for god læring i mat og helse)?
 - → hvilken måte er den beste for å lære teori i mat og helse på?
 - Noen undervisningsmetoder?
 - Lærer dere noe teori i mat og helse? Når lærer dere om dette? Hva synes dere om teori-timene i dette faget? Hva lærer dere? Lære om matvarer, helsen vår, hva vi bør og ikke bør spise?
 - Synes dere faget trenger å forandres på noen måte? Teoriundervisningen?
 - Utdype → hva kan gjøre faget enda bedre? Noe dere ikke liker så godt i timen?
 - Hvis dere skulle lære noe i mat og helse på en annen måte – hvordan kunne det vært?
 - Hvilke undervisningsmetoder liker dere best? Hvorfor?
 - Hva synes dere om eksperimenter/lab og utforskende oppgaver i undervisningen (gjelder ikke matlaging)? Eks. Nysgjerrigper? Utdype?
 - Lager dere mer mat hjemme etter å ha hatt mat og helse på skolen? → Utdype (ferdigheter)
 - Er dere blitt mer glad i å lage mat etter dere begynte med dette faget?
 - Faget heter mat og helse; lærere dere om hvordan mat påvirker helsen deres? (kunnskap)
 - Har det å ha mat og helse gjort at dere tenker mer over hva dere spiser? Tenker der mer over hvordan maten dere spiser påvirker helsen deres? (holdninger)
 - Er det noe dere husker spesielt godt fra undervisningen som var bra?
-
- Avslutning: Noe mer dere vil si?
 - Oppsummere hovedpoengene

Intervjuguide elever

Grønn: samme spm. som spørreskjema

Rød: hva LifeLab skal bli

Blå: muligheter og utfordringer for LifeLab

Åpning

- Ønsker velkommen
- Fortelle kort om LifeLab
- Forteller om målet med intervjuet, litt om tid og type spørsmål
→ viktig å utdype!
- Info om taushetsplikt, opptak, anonymitet etc.
- Info om ingen riktige eller gale svar
- Spørre om de har noen spørsmål før vi setter i gang
- Starte opptak

- Hvilket trinn underviser du mat og helse på?
 - Hvordan er din generelle opplevelse av mat og helse faget? (2 min)
 - Hva opplever du er det viktigste for god læring i dette faget?
 - Noen undervisningsmetoder?
 - Hva opplever du er de største barrierene for god læring/undervisning i mat og helse?
 - Mener du faget trenger å fornyes på noen måte?
 - Utdype → hva trenger faget for å gjøre det bedre?
 - Spørreskjema: fornying av kompetansemålene → innspill?
 - Hvilke elementer skulle et nytt (LifeLab) undervisningsopplegg inneholdt?
 - Hvilke undervisningsmetoder skulle det bestå av/inkludere? Hvorfor?
 - Hva skal til for å få LifeLab inn i den ordinære undervisningen?
 - Kan du tenke deg noen barrierer knyttet til å implementere LifeLab i den ordinære undervisningen? Hvilke?
 - Hva kan man gjøre for å komme utenom disse barrierene? (Reelle)
 - Hva er din erfaring med eksperimenter og utforskende oppgaver i undervisningen (utenfor praktisk matlaging)? Eks. Nysgjerrigper?
- Avslutning: Noen andre kommentarer eller innspill?

Grønn: samme spm. som spørreskjema

Rød: hva LifeLab skal bli

Blå: muligheter og utfordringer for LifeLab

<p>Åpning</p> <ul style="list-style-type: none">• Ønsker velkommen• Fortelle kort om LifeLab• Forteller om <u>målet med intervjuet</u>, litt om tid og type spørsmål → viktig å utdype!• Info om taushetsplikt, opptak, anonymitet etc.• Info om <u>ingen riktige eller gale svar</u>• Spørre om de har noen spørsmål før vi setter i gang• Starte opptak
<ul style="list-style-type: none">• Hvordan er din generelle opplevelse av mat og helse-faget? (2 min)• <u>Tenker du at faget trenger å fornyes på noen måte?</u><ul style="list-style-type: none">○ <u>Utdype → hva trenger faget for å gjøre det bedre?</u>• <u>Hvilke muligheter ser du for tverrfaglighet og mat og helse?</u>• Hvilke elementer skulle et nytt (LifeLab) undervisningsopplegg inneholdt?<ul style="list-style-type: none">○ Hvilke undervisningsmetoder skulle det bestå av/inkludere? Hvorfor?• Hva skal til for å få LifeLab inn i den ordinære undervisningen?• Hvilke potensielle barrierer ser du ved å skulle inkludere/implementere LifeLab til ordinær undervisning?<ul style="list-style-type: none">○ På hvilken måte?• Hvordan ville du foretrukket at LifeLab ble formidlet til skolene?<ul style="list-style-type: none">○ Opplæring, oppstartspakke og video med forklaring?• Hvordan ville du stilt deg til å inkludere LifeLab ved din skole?<ul style="list-style-type: none">○ Hva skulle gjøre det mulig?
<ul style="list-style-type: none">• Noen andre kommentarer eller innspill?

Grønn: samme spm. som spørreskjema

Rød: hva LifeLab skal bli

Blå: muligheter og utfordringer for LifeLab

Bakgrunn: Meld. St. 28 37 Fag – Fordypning – Forståelse

"Å utvikle fag parallelt og se fag i sammenheng, er også et grep som kan bidra til at undervisning i ulike fag gjensidig kan forsterke hverandre. Dette vil kunne gi bedre progresjon i det enkelte fag ved at det systematisk legges til rette for hvordan kompetanse bygget i ett fag, kan anvendes i et annet"

Og

" I internasjonalt forsknings- og utredningsarbeid og i flere lands læreplaner legges det vekt på at elevene trenger øvelse i å bruke kunnskaper og ferdigheter fra ulike fag i sammenheng".

Mål: tverrfaglighet

Målgruppe	Matte- og naturfagslærer
Status i dag	<ul style="list-style-type: none">• Kan dere si kort hvilke fag og trinn underviser dere på samt den formelle kompetansen deres?• Hvordan oppfatter dere det tverrfaglige arbeidet mellom matte, naturfag og mat og helse i dag?<ul style="list-style-type: none">○ Hvorfor er det slik?• Hvordan jobber dere med tverrfaglighet i disse fagene?• Hvilken betydning tror du økt tverrfaglighet mellom disse tre fagene kan ha?<ul style="list-style-type: none">○ Er det viktig og hvorfor evt.?
Hva kan vi gjøre bedre/annerledes for å styrke samarbeidet mellom fagene	<ul style="list-style-type: none">• Hvilke muligheter har vi for tverrfaglighet mellom disse fagene?<ul style="list-style-type: none">○ Hva må til for å få det til?• På hvilke områder/tematikk tenker dere dette er mest aktuelt?• Hva er barrierene for tverrfaglighet mellom disse fagene

Appendix IV

Information letters and consent forms

Simplified information letter for students

Vil du være med i forskningsprosjektet *"LifeLab Mat og helse"*?

Hva handler det om?

På universitetet gjennomfører vi nå et forskningsprosjekt som vi har kalt *LifeLab Mat og Helse*. Det handler om å lage noen nye lab-øvelser som gjør at dere kan forstå bedre, for eksempel hva som skjer i kroppen når vi spiser mat. For å finne ut hva dere synes kan være bra og lære mer om, så vil vi gjerne snakke med dere om disse tingene. Det kalles et intervju, som du er med på sammen med andre elever i klassen din. Intervjuene vil bli tatt opp med båndopptaker og så skriver vi det ned etterpå. Det varer omtrent en skoletime og er på skolen. Intervjuet vil bli gjennomført av noen fra universitetet. Etter at de nye tingene i LifeLab er laget, så kommer det noen studenter fra UiA på besøk til dere og tester det ut i en mat og helse-time. Denne timen skal vi filme for å kunne se hvordan det fungerer og etterpå vil vi gjerne spørre dere om dere likte det og hva dere synes.

Det er frivillig å være med og du velger selv om du vil delta.

Hvis du lurer på noe, så kan du spørre Cecilie når hun kommer på skolen.

Vennlig hilsen Cecilie Beinert,

Stipendiat, LifeLab

Fakultet for helse- og idrettsvitenskap, UiA

Telefon: 38141849

Mail: cecilie.beinert@uia.no

Parental information letter and consent form

Mapping (interview)

Forespørsel om deltakelse i forskningsprosjektet: *"LifeLab Mat og helse"*

Informasjon om studien

De store helseutfordringene i dagens samfunn som er knyttet til kosthold kan forebygges. Mat og helse i skolen kan gi alle barn, uansett sosial bakgrunn, praktiske ferdigheter og kunnskap om kostholdets betydning for kropp og helse.

Universitetet i Agder gjennomfører nå en studie som har som mål å utvikle og evaluere et forskningsbasert og innovativt *undervisningsopplegg*, kalt *LifeLab*, i utdanningen av mat og helse lærere og i opplæring av elever i samme fag. Vi ønsker å få innsikt i dagens mat og helseundervisning ved å intervju ulike personer relevante for mat og helse (elever, lærere og rektorer) ved pilot-skoler i Agder. Vi ønsker på denne måten å få mer kunnskap om muligheter og utfordringer innen faget og hva som kan gjøres for å forbedre det. Basert på funnene fra disse intervjuene ønsker vi å utvikle og evaluere *LifeLab*, med mål om å gi elever økt kunnskap, ferdigheter og forståelse av faget.

LifeLab skal utvikles for to målgrupper: 1) Studenter ved UiA som selv får kompetanse i metodikken og som ferdig utdannede lærere kan bruke «minilaboratorier» i undervisning på sine skoler i hele Norge 2) Elever i regionen som får noe av sin mat og helse-undervisning gjennom *LifeLab*. *LifeLab* vil være tematisk knyttet til hvert av de tre hovedområdene i Kunnskapsløftet; Mat og livsstil, Mat og forbruk og Mat og kultur.

Hva innebærer deltakelse i studien?

Deltakelse i studien innebærer at ditt barn er med på ett gruppeintervju sammen med andre elever i klassen hvor vi ønsker å høre om barnas erfaringer fra dagens mat og helseundervisning, samt om de har noen ideer til hva som kan gjøres annerledes. Intervjuene vil bli tatt opp med båndopptaker og skrevet ned som tekst etterpå (transkribert). Intervjuet vil vare ca. 30-40 minutter og vil foregå på skolen, i tidsperioden xx-xx, og vil bli gjennomført av prosjektmedarbeidere. Etter at *LifeLab* er utviklet, ønsker vi å evaluere gjennomførbarheten av *LifeLab* ved at studenter i mat og helse ved UiA besøker pilot-skolene og prøver ut metoden i en mat og helse-time. For å kunne evaluere dette, så vil denne undervisningen bli filmet, for å få bedre innsikt i gjennomførbarheten og hvordan elevene jobber og samhandler i timen. Vi ønsker så å gjennomføre et gruppeintervju i etterkant av utprøvingen, for å få innsikt i elevenes opplevelse av *LifeLab*-timen.

Mulige fordeler og ulemper

Studien vil ikke føre til noen ulemper for ditt barn utover den tiden det tar å delta på intervjuene og LifeLab-timen på skolen. Fordelen med studien er at den vil gi ny og nyttig kunnskap i arbeidet med å styrke det forebyggende helsearbeidet via mat og helse undervisning i skolen og på den måten stimulere til et sunnere kosthold blant barn i Norge.

Hva skjer med informasjonen om ditt barn?

All informasjon fra ditt barn vil utelukkende bli brukt til forskning i henhold til gjeldende nasjonal lovgivning, og ingen uvedkommende vil få tilgang til dem. Alle personlige opplysninger og kjennetegn om ditt barn som måtte fremkomme under intervjuet (eks. navn og skoletilhørighet), vil bli anonymisert fortløpende/etterhvert som de blir transkribert, og senest innen 2022, når prosjektet avsluttes. Videopptak fra evalueringen og informasjon fra dette (f.eks. stillbilder og sitater) vil bli redigert/sladdet, slik at det ikke vil være mulig å gjenkjenne ditt barn når resultatene publiseres. Du som forelder har muligheten til å se spørsmålene vi har tenkt til å stille elevene under intervjuet før de gjennomføres, dersom dette er ønskelig.

Frivillig deltakelse.

Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn for dette. Dersom du ønsker å trekke ditt samtykke vil opplysningene om ditt barn anonymiseres.

Dersom du har spørsmål til studien, ta kontakt med prosjektleder Frøydis Nordgård Vik på e-post: froydis.n.vik@uia.no.

Denne studien er knyttet til forskningsgruppen Feed (uia.no/feed) ved Fakultet for helse- og idrettsvitenskap (UiA).

Studien er meldt til Personvernombudet for forskning, NSD - Norsk senter for forskningsdata AS.

Samtykke til deltakelse i studien

Jeg har mottatt informasjon om studien, og mitt barn har tillatelse til å delta i intervjuet beskrevet over samt delta i mat og helse-timen som filmes.

(Navn på barnet)

(Signatur forelder/foresatt, dato)

Parental information letter and consent form

Testing (Video)

Forespørsel om deltakelse i forskningsprosjektet: *"LifeLab Mat og helse"*

Informasjon om studien

De store helseutfordringene i dagens samfunn som er knyttet til kosthold kan forebygges. Mat og helse i skolen kan gi alle barn, uansett sosial bakgrunn, praktiske ferdigheter og kunnskap om kostholdets betydning for kropp og helse.

Universitetet i Agder gjennomfører nå en studie som har som mål å utvikle og evaluere et forskningsbasert og innovativt *undervisningsopplegg*, kalt *LifeLab*, i utdanningen av mat og helse lærere og i opplæring av elever i samme fag. For elevene er målet å gi økt kunnskap, ferdigheter og forståelse av faget. Vi har så langt i prosjektet fått innsikt i dagens mat og helseundervisning ved at vi intervjuet ulike personer relevante for mat og helse (elever, lærere og rektorer) ved pilot-skoler i Agder som er med i dette prosjektet. Målet med disse intervjuene var å få mer kunnskap om muligheter og utfordringer innen faget, og hva som kan gjøres for å forbedre det. Basert på innspillene fra disse intervjuene har vi nå utviklet et undervisningsopplegg, en *LifeLab*, som vi nå skal evaluere som undervisningsmetode.

Hva innebærer deltakelse i studien?

Nå som *LifeLab* er utviklet, skal vi evaluere gjennomførbarheten og innholdet ved at studenter ved UiA prøver ut metoden i en mat og helse-time ved din skole. For å kunne evaluere dette på en god måte, så vil denne undervisningsøkten bli filmet. Rent praktisk vil det stå et lite minikamera i ro på hvert bord/stasjon i klasserommet. Dette gjør vi for å kunne analysere hvordan elevene jobber, diskuterer og samhandler i timen. Vi gjennomfører så et gruppeintervju/ samtale med elevene i etterkant av utprøvingen. På denne måten kan vi få innsikt i elevenes opplevelse og læringsutbytte av *LifeLab*-timen. Gruppeintervjuet vil vare i 10-15 minutter og vil bli tatt opp med lydopptaker. De barna som ikke har foreldresamtykke til å bli filmet eller intervjuet, vil delta på et alternativt opplegg på skolen.

Mulige fordeler og ulemper

Studien vil ikke føre til noen ulemper for ditt barn utover den tiden det tar å eventuelt delta på intervjuet/samtalen i etterkant av *LifeLab* timen, samt at barnet ditt filmes under undervisningsøkten. Fordelen med studien er at den vil gi ny og nyttig kunnskap i arbeidet med å styrke det forebyggende helsearbeidet via mat og helse undervisning i skolen og på den måten stimulere til et sunnere kosthold blant barn i Norge.

Hva skjer med informasjonen om ditt barn?

All informasjon om ditt barn vil utelukkende bli brukt til forskning i henhold til gjeldende nasjonal lovgivning, og ingen uvedkommende vil få tilgang til dem. Alle personlige opplysninger og kjennetegn om ditt barn (eks. navn og skoletilhørighet), som måtte fremkomme under intervjuet vil bli anonymisert fortløpende/etterhvert som de blir transkribert, og senest innen 2022, når prosjektet avsluttes. Videopptak fra gjennomføringen av undervisningen og informasjon fra dette (f.eks. stillbilder og sitater) vil bli redigert/sladdet, slik at det ikke vil være mulig å gjenkjenne ditt barn når resultatene senere formidles.

Frivillig deltakelse

Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn for dette. Dersom du ønsker å trekke ditt samtykke vil opplysningene om ditt barn anonymiseres.

Dersom du har spørsmål til studien, ta kontakt med prosjektleder Frøydis Nordgård Vik på e-post: froydis.n.vik@uia.no.

Denne studien er knyttet til forskningsgruppen Feed (uia.no/feed) ved Fakultet for helse- og idrettsvitenskap (UiA).

Studien er godkjent av Personvernombudet for forskning, NSD - Norsk senter for forskningsdata AS.

Samtykke til deltakelse i studien

Jeg har mottatt informasjon om studien, og mitt barn har tillatelse til å bli filmet i mat og helse-timen med LifeLab og å delta på gruppeintervjuet i etterkant.

(Navn på barnet)

(Signatur forelder/foresatt, dato)

Information letter and consent form for FH teachers

Mapping (interview)

Forespørsel om deltakelse i forskningsprosjektet:

"LifeLab Mat og helse"

Bakgrunn og formål

De store helseutfordringene i dagens samfunn som overvekt, livsstilssykdommer og psykisk uhelse kan alle forebygges. Mat og helse i skolen har den unike fordel at det kan gi alle barn, uansett sosial bakgrunn, praktiske ferdigheter og kunnskap om kostholdets betydning for kropp og helse.

Universitetet i Agder gjennomfører nå en studie som har som mål å utvikle og evaluere et forskningsbasert og innovativt *undervisningsopplegg*, en *LifeLab*, i utdanningen av mat og helse lærere og i opplæring av elever i samme fag. Vi ønsker å få innsikt i dagens mat og helseundervisning ved å intervju ulike personer relevante for mat og helse (elever, lærere og rektorer) ved pilot-skoler i Agder. Vi ønsker på denne måten å få mer kunnskap om muligheter og utfordringer innen faget og hva som kan gjøres for å forbedre det. Basert på blant annet funnene fra disse intervjuene ønsker vi å utvikle LifeLab med mål om å gi elever økt kunnskap, ferdigheter og forståelse av faget. Når LifeLab er utviklet ønsker vi at mat og helse-studenter ved UiA kan komme til fokus-skolene og prøve ut metoden på en klasse i 6. og 9. trinn, for å evaluere gjennomførbarheten. Denne timen vil bli filmet for å få et innblikk gjennomførbarheten og hvordan elevene jobber. Deretter ønsker vi å gjennomføre fokusgruppeintervjuer av elevene og studentene får å høre hvordan de opplevde det.

LifeLab skal utvikles for to målgrupper: 1) Studenter ved UiA som selv får kompetanse i metodikken og som ferdig utdannede lærere kan bruke «minilaboratorier» i undervisning på sine skoler i Norge 2) Elever i regionen som kan få noe av sin mat og helse-undervisning gjennom LifeLab- metoden ved sin egen skole. LifeLab vil være tematisk knyttet til hvert av de tre hovedområdene i Kunnskapsløftet; Mat og livsstil, Mat og forbruk og Mat og kultur.

Hva innebærer deltakelse i studien?

Deltakelse i studien innebærer å være med på ett intervju alene (på skolen eller per telefon) eller sammen med eventuell mat og helse-kollega (på skolen) som blir ledet av prosjektmedarbeidere. Målet med intervjuet er å få informasjon og erfaringer fra dagens mat og helseundervisning, og om dere har noen ideer om hva som kan gjøres annerledes. Intervjuene vil bli tatt opp med båndopptaker og transkribert i etterkant. Intervjuet vil vare ca. 20-30 minutter, i tidsperioden xx-xx.

Mulige fordeler og ulemper

Studien vil ikke føre til noen ulemper for deg, utover den tiden det vil ta å delta på intervjuet. Fordelen med studien er at den vil gi ny og nyttig kunnskap i arbeidet med å styrke det forebyggende

helsearbeidet via mat og helse undervisning i skolen og på denne måten stimulere til et sunnere kosthold blant barn i Norge. Du har her muligheten til å påvirke hvordan en LifeLab kan se ut, og som forhåpentligvis kan bli ansett som "best practice" i mat og helse. Din erfaring som lærer i mat og helse vil gi oss nyttig informasjon vi kan jobbe videre med for å skape den beste undervisningen i faget.

Hva skjer med informasjonen om deg?

All informasjon fra deg vil utelukkende bli brukt til forskning i henhold til gjeldende nasjonal lovgivning, og ingen uvedkommende vil få tilgang til dem. Alle personlige opplysninger og kjennetegn om deg som måtte fremkomme under intervjuet (eks. navn eller skoletilhørighet), vil bli anonymisert fortløpende/etterhvert som de blir transkribert, og senest innen år 2022, når prosjektet avsluttes.

Frivillig deltakelse.

Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn for dette. Dersom du ønsker å trekke ditt samtykke vil opplysningene dine anonymiseres.

Dersom du har spørsmål til studien, ta kontakt med prosjektleder Frøydis Nordgård Vik på telefon 38141855, eller mail froydis.n.vik@uia.no.

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Studien er godkjent av Personvernombudet for forskning, NSD - Norsk senter for forskningsdata AS.

Samtykke til deltakelse i studien

Jeg har mottatt informasjon om studien, og er villig til å delta

(Signert av prosjektdeltaker, dato)

Information letter and consent form for head teachers

Mapping (interview)

Forespørsel om deltakelse i forskningsprosjektet:

”LifeLab Mat og helse”

Bakgrunn og formål

De store helseutfordringene i dagens samfunn som overvekt, livsstilssykdommer og psykisk uhelse kan alle forebygges. Mat og helse i skolen har den unike fordel at det kan gi alle barn, uansett sosial bakgrunn, praktiske ferdigheter og kunnskap om kostholdets betydning for kropp og helse.

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LifeLab skal utvikles for to målgrupper: 1) Studenter ved UiA som selv får kompetanse i metodikken og som ferdig utdannede lærere kan bruke «minilaboratorier» i undervisning på sine skoler i Norge. 2) Elever i regionen som får noe av sin mat og helse-undervisning gjennom LifeLab-metoden. LifeLab vil være tematisk knyttet til hvert av de tre hovedområdene i Kunnskapsløftet; Mat og livsstil, Mat og forbruk og Mat og kultur.

Hva innebærer deltakelse i studien?

Deltakelse i studien for deg innebærer å være med på ett intervju som vil vare i ca. 20-30 min, i tidsperioden xx-xx. Dette kan skje enten på telefon eller ved å treffes på skolen, på et tidspunkt som passer for deg. Målet med intervjuet er å få mer kunnskap om ulike barrierer og muligheter i mat og helsefaget. Vi ønsker å få innsikt i dine erfaringer fra dagens mat og helseundervisning, sett fra et faglig og administrativt perspektiv. Intervjuene vil bli tatt opp med båndopptaker og vil bli gjennomført av prosjektmedarbeidere.

Mulige fordeler og ulemper

Studien vil ikke føre til noen ulemper for deg, utover den tiden det vil ta å delta på intervjuet. Fordelen med studien er at den vil gi ny og nyttig kunnskap i arbeidet med å styrke det forebyggende helsearbeidet via mat og helse undervisning i skolen og på den måten stimulere til å fremme et sunnere kosthold blant barn i Norge. Kunnskapen du som rektor har om hvilke muligheter og barrierer som finnes i skolen vil gi oss svært nyttig informasjon som vi kan bruke i utviklingen av LifeLab.

Hva skjer med informasjonen om deg?

All informasjon fra deg vil utelukkende bli brukt til forskning i henhold til gjeldende nasjonal lovgivning, og ingen uvedkommende vil få tilgang til dem. Alle personlige opplysninger og kjennetegn om deg som måtte fremkomme under intervjuet (eks. navn eller skoletilhørighet), vil bli anonymisert fortløpende/etterhvert som de blir transkribert, og senest innen år 2022, når prosjektet avsluttes.

Frivillig deltakelse

Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn for dette. Dersom du ønsker å trekke ditt samtykke vil opplysningene dine anonymiseres.

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Studien er godkjent av Personvernombudet for forskning, NSD - Norsk senter for forskningsdata AS.

Samtykke til deltakelse i studien

Jeg har mottatt informasjon om studien, og er villig til å delta

(Signert av prosjektdeltaker, dato)

Information letter and consent form for interdisciplinary
teaching (math, science and FH)
Mapping (interview)

Forespørsel om deltakelse i forskningsprosjektet:

"LifeLab Mat og helse"

Bakgrunn og formål

De store helseutfordringene i dagens samfunn som overvekt, livsstilssykdommer og psykisk uhelse kan alle forebygges. Mat og helse i skolen har den unike fordel at det kan gi alle barn, uansett sosial bakgrunn, praktiske ferdigheter og kunnskap om kostholdets betydning for kropp og helse.

Universitetet i Agder gjennomfører nå en studie som har som mål å utvikle og evaluere et forskningsbasert og innovativt *undervisningsopplegg*, en *LifeLab*, i utdanningen av mat og helse lærere og i opplæring av elever i samme fag. Vi ønsker å få innsikt i dagens mat og helseundervisning ved å intervju ulike personer relevante for mat og helse (elever, lærere og rektorer) ved pilot-skoler i Agder. Vi ønsker på denne måten å få mer kunnskap om muligheter og utfordringer innen faget og hva som kan gjøres for å forbedre det. Basert på blant annet funnene fra disse intervjuene ønsker vi å utvikle LifeLab med mål om å gi elever og studenter økt kunnskap, ferdigheter og forståelse av faget. Når LifeLab er utviklet ønsker vi å komme til pilot-skolene slik at mat og helse-studenter ved UiA kan prøve ut metoden på en klasse i 6. og 9. trinn, for å evaluere gjennomførbarheten. Denne timen vil bli filmet for å få et innblikk gjennomførbarheten og hvordan elevene jobber. Deretter ønsker vi å gjennomføre fokusgruppeintervjuer av elevene og studentene får å høre hvordan de opplevde det.

LifeLab skal utvikles for to målgrupper: 1) Studenter ved UiA som selv får kompetanse i metodikken og som ferdig utdannede lærere kan bruke «minilaboratorier» i undervisning på sine skoler i hele Norge 2) Elever i regionen som får noe av sin mat og helse-undervisning gjennom LifeLab. LifeLab vil være tematisk knyttet til hvert av de tre hovedområdene i Kunnskapsløftet; Mat og livsstil, Mat og forbruk og Mat og kultur.

Hva innebærer deltakelse i studien?

Deltakelse i studien innebærer å være med på ett intervju (på skolen eller per telefon) alene eller sammen med eventuell annen mattelærer, naturfagslærer og mat og helse-lærer som blir ledet av prosjektmedarbeidere. Målet med intervjuet er å få innsikt i tverrfaglighet mellom fagene mat og helse, naturfag og matte og om dere har noen ideer om hva som kan gjøres annerledes. Intervjuene vil bli tatt opp med båndopptaker og transkribert i etterkant. Intervjuet vil vare ca. 20-30 minutter, og gjennomføres i juni 2018.

Mulige fordeler og ulemper

Studien vil ikke føre til noen ulemper for deg, utover den tiden det vil ta å delta på intervjuet. Fordelen med studien er at den vil gi ny og nyttig kunnskap i arbeidet med å styrke det forebyggende helsearbeidet via mat og helse undervisning i skolen og på denne måten stimulere til et sunnere kosthold blant barn i Norge. Du har her muligheten til å påvirke hvordan en LifeLab kan se ut, og som forhåpentligvis kan bli ansett som "best practice" i mat og helse. Din erfaring som lærer vi gi oss verdifull informasjon til prosjektet.

Hva skjer med informasjonen om deg?

All informasjon fra deg vil utelukkende bli brukt til forskning i henhold til gjeldende nasjonal lovgivning, og ingen uvedkommende vil få tilgang til dem. Alle personlige opplysninger og kjennetegn om deg som måtte fremkomme under intervjuet (eks. navn eller skoletilhørighet), vil bli anonymisert fortløpende/etterhvert som de blir transkribert, og senest innen år 2022, når prosjektet avsluttes.

Frivillig deltakelse

Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn for dette. Dersom du ønsker å trekke ditt samtykke vil opplysningene dine anonymiseres.

Dersom du har spørsmål til studien, ta kontakt med prosjektleder Frøydis Nordgård Vik på telefon 38141855, eller mail froydis.n.vik@uia.no.

Denne studien er knyttet til forskningsgruppen Feed (uia.no/feed) ved Fakultet for helse- og idrettsvitenskap.

Studien er godkjent av Personvernombudet for forskning, NSD - Norsk senter for forskningsdata AS.

Samtykke til deltakelse i studien

Jeg har mottatt informasjon om studien, og er villig til å delta

(Signert av prosjektdeltaker, dato)

Appendix V

LifeLab learning tasks

Hva inneholder maten?

Lærer og elever kan innledningsvis kort snakke om de ulike energigivende næringsstoffene og klargjøre hva tilsatt sukker og naturlig sukker er og hvordan vi kan finne alt dette i matvarene ved å lese på ingredienslisten og næringsdeklarasjonen. Sukkerbitene skal illustrere naturlig sukker og tilsatt sukker i matvarene. Dette kalles "sukkerarter" på matvarene.

1 porsjon yoghurt er 125g

1 porsjon prim er 15g (samme som Nugatti).

1 sukkerbit veier ca. 2 gram

Utregning: Mengde per 100g / 100 x porsjon (eks 125g i yoghurt)

Læreren viser først hvor mye sukker det er i Cola for å fange oppmerksomheten deres og innlede det å fine suktermengde. Så går de gjennom utregning av en porsjon med prim (elevene får utlevert en boks per gruppe) som eksempel med sammen med klassen. Formelen skrives på tavlen mens de regner ut, slik at elevene kan følge den etterpå. Deretter skal elevene finne en porsjon sukker på resterende produkter (begge yoghurtene) i gruppene. På frokostblandingene og sjokoladepålegget står det allerede oppført, slik at de kun trenger å telle opp og plassere riktig mengde sukkerbiter til disse produktene. Dette gjør de til sist.

Elevene bruker sukkerbiter og kalkulator til å finne mengde sukker. Elevene blir gitt den mengden sukkerbiter som er i en porsjon av all produktene samlet innledningsvis, slik at de ikke skal sitte igjen med ekstra sukkerbiter etter at de har målt opp alle matvarene (om de har regnet riktig). Sukkerbitene legges i små kopper og plasseres ved produktet det tilhører. Etterpå kan man (om man har tid) ta en gjennomgang av forskjeller i fiberinnhold, fettinnhold, tilsatt sukker og salt mellom de liknende produktene av samme type.

Til refleksjon

1. Hvilket produkt inneholder mest sukker?
2. Var sukkerinnholdet slik du trodde?
 - Hva var eventuelt likt eller annerledes?
3. hva er anbefalingen for inntak av sukkerrike matvarer?
4. Se nå på næringsstoffene fiber, tilsatt sukker (se ingredienslista), salt og mettet fett. Sammenlikn innholdet av disse næringsstoffene i:
 - Prim mot sjokoladepålegg
 - Gresk yoghurt mot fruktyoghurt
 - Havrefras mot Coco pops
 - Hva er likt eller ulikt i de ulike produktene når det gjelder disse næringsstoffene?

Rangere bilder

På bordet til gruppene får elevene bilder av 8 ulike produkter. Disse skal elevene gruppevis plassere på en linje fra den de mener er mest næringsrik til minst næringsrik. Alle skal prøve så godt det lar seg gjøre å bli enige om rekkefølgen. Er de ikke enige, må de snakke sammen og begrunne hvorfor dere mener som de gjør. Kanskje blir dere enige til slutt?

Når alle er ferdige tar læreren en felles gjennomgang på tavla i plenum. Tar opp ett og ett kort og spør hvor den skal. Alle skal prøve å bli enige om en "riktig" rekkefølge. Læreren kommer med noen fakta om næringsinnholdet i de ulike underveis, som kanskje vil endre meningen til elevene.

Konklusjonen er at det er vanskelig å rangere en og en matvare, og spesielt forskjellige matvaregrupper opp mot hverandre. Alle er en del av et vanlig kosthold og det er mengden vi spiser av de som betyr noe.

Til refleksjon

1. Hvordan var det å skulle rangere matvarene?
2. Hvordan vurderte dere om matvaren var næringsfattig eller næringsrik?
3. Hvorfor har dere valgt å rangere de slik dere har gjort?
4. Inneholder matvaren andre næringsstoffer, fiber, vitaminer osv. som har betydning?
5. Hva er største forskjellen på prim og sjokoladepålegg mtp. næringsinnhold?
6. Hva er største forskjellen på gresk yoghurt med frukt og fruktyoghurt mtp. næringsinnhold?

Jakten på 5 om dagen

Elevene får presentert et utvalg frukt, bær og grønnsaker og skal gruppevis ta den mengden de mener tilsvarer "5 om dagen" på en tallerken. Dette skal de så veie og skrive ned. Så skal de gruppene som har tatt appelsin og banan skrelle disse (da disse har mye skall) og veie de på nytt uten skall. Hvor mye ble det da? Har noen av gruppene klart å finne tilsvarende "5 om dagen" → 500g? Da kan vi se på denne mengden og snakke om:

- Hvorfor anbefales vi å spise minimum "5 om dagen"?
- Er det forskjell på mengden et barn og en voksen skal spise?
 - 500g voksne, litt mindre for barn (håndstørrelse)
- Hvor mye er en porsjon egentlig?
- Hvem tok frossen frukt/grønnsaker, potet, belgvekster eller hermetiske tomater?
 - Klargjøre at belgvekster, urter og potet ikke teller som en av 5 om dagen, men at både friske, frosnevarmebehandlede og hermetiske frukt, bær og grønnsaker gjør det. Det samme gjør en porsjon med juice. Måler dette på nytt uten.
- Hvordan samsvarer dette med den mengden de selv spiser?
- Var det som forventet?

De skal så dele denne mengden på 4 måltider

- Ser det mye eller lite ut?

teori:

Barn anbefales 5 håndfuller med frukt, bære og grønnsaker hver dag. Helst litt mer grønnsaker enn frukt (3/2)

Fra Ungkost 2017: Det gjennomsnittlige inntaket av grønnsaker, frukt og bær (inkludert maksimalt 100 g juice/most per person) hos 4. klassingene var henholdsvis 195 og 200 gram per dag for gutter og jenter. Det gjennomsnittlige inntaket av grønnsaker, frukt og bær (inkludert maksimalt 100 g juice/most per person) hos 4. klassingene var henholdsvis 195 og 200 gram per dag for gutter og jenter. Tilsvarende mengder for 8. klassingene var 179 gram hos guttene og 200 gram hos jentene.

LifeLab Jigsaw!

1. Alle elevene får utlevert en tekst som de leser hver for seg i gruppa (4 ulike tekster på 4 elever)
2. Ord som elevene synes er vanskelige og vil diskutere med lærer og medelever etterpå markerer de direkte på arket med en white-Board pen de får utlevert.
3. Når alle har lest ferdig ber læreren elevene gå i gruppe med de andre som har lest samme tekst og diskutere innholdet sammen. Dette kalles nå en ekspertgruppe og de skal sammen bli enige om hva som er det viktigste å formidle til de andre gruppene.
 - Tenk: Hva er det vi nettopp har lest?
 - Lærer hjelper med vanskelige ord
4. Når de er enige om innholdet som skal videreformidles, skal de gå tilbake til de opprinnelige gruppene sine og gjenfortelle **det viktigste** til sine medelever.
 - De skal tenke: hva vil jeg at de skal lære av meg? Jeg er nå eksperten!
 - De andre tar notater og spør om det de måtte lure på
5. Elevene ruller med å presentere og ta notater. Alle skal presentere for alle

Her er det viktig at elevene forstår at de selv er en viktig brikke for de andre sin læring: har de ikke lest, kan de ikke lære det videre heller!

Linje-leken

Lærer sier noen påstander der elevene skal ta stilling til:

Enig → uenig

Ja → nei

Viktig → uviktig

Osv.

Lappene der det står enig på en og uenig på en annen, plasserer på veggen i hver ende av klasserommet eller noen holder de opp. Eleven plasserer seg så et sted mellom ytterpunktene, til enten helt enig, litt enig eller helt uenig i påstanden.

Så stiller læreren åpne spørsmål der elevene skal begrunne og hvorfor de står der de står. Målet er at elevene skal kunne ta stilling til påstander om kosthold og helse, og få mulighetene til å flytte på seg når lærer kommer med mer informasjon. Kanskje de endrer mening, og dermed plassering, når de får vite mer?

Aktiviteten begynner med å bli kjent med brødskalaen. Det vises to typer brød som elevene skal gjette hvor hører hjemme: fint, halvgrovt, grovt eller ekstra grovt. Brødskalaen plasseres som en skala, fra en side av rommet til en annen. Underveis snakkes det om forskjellen på næringsinnhold og anbefalingene.

50 -leken

Det lages 50 ulike spørsmål/aktiviteter.

Spørsmålene fordeles på de 50 kortene, med tall fra 1-50 på den ene siden og et spørsmål på den andre siden (evt. lage det tosidig, slik at man kun har 25 kort som i dette tilfellet).

Kortene fordeles enten rundt i klasserommet eller ute i skoleområdet. De kan f.eks. henges i trær, pulter, stoler eller legges på bakken. Elevene er i grupper på 3-4, og finner en dyrelyd som skal være deres "lokkesignal". Leken starter med at det kastes en terning. Kaster de 3, skal de finne post nr. 3. De skal nå finne denne posten og gjennomføre oppgaven/si hva svaret er til lærer. Blir det godkjent kan elevene kaste terningen igjen. Kaster elevene nå tallet 4 skal de plusse 3 og 4 og finne tallet 7. svarer de feil, kaster ikke elevene terning, men legger til 1. De får de vite svaret (slik at de lærer noe) før de går videre. Slik fortsetter de helt til første gruppe har kommet til post nr. 50!

Pictures used in the picture-ranking learning task









Jigsaw 6th grade

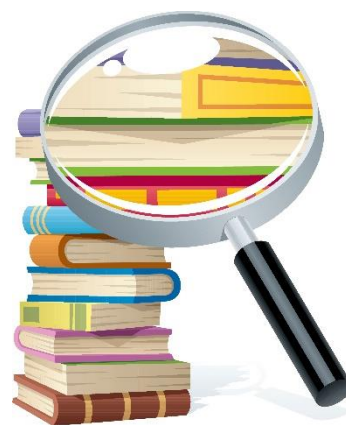
Kostråd til å stole på?

På TV, på radio og i sosiale medier kan vi høre og lese mye om hva slags mat som er sunn og hvilket *kosthold* som gir god helse. Mange av disse rådene varierer utfra hvor vi leser om det. Det gjør folk forvirret og usikre på hva som er sant. Kan vi stole på alt vi blir fortalt?



Noen mennesker tjener penger på at vi følger de på Instagram eller andre sosiale medier. Dette er fordi disse menneskene får betalt for å *reklamere* for produkter til ulike selskaper. Det er derfor lurt å være skeptiske til å kjøpe produkter eller følge anbefalinger om kosthold som kommer fra enkeltpersoner. Er personen som gir disse kostholdsrådene *egnet* til å gi kostholdsråd? Er det noen som tjener penger på å selge dette produktet? Dette er spørsmål vi bør stille oss selv.

Noe informasjon om hva som er et sunt kosthold kommer ikke fra noen som ønsker å tjene penger på sine råd. Dette gjelder for eksempel *Helsedirektoratet*. Helsedirektoratet gir kostholdsråd til *befolkningen*. Disse rådene er basert på *dokumenterbar kunnskap*, altså kunnskap man har fått gjennom mange år med *forskning*. Denne informasjonen bør være *førstevalget* når vi ønsker å vite mer om hva vi bør spise for å ha god helse. Helsedirektorater har også laget anbefalinger for den maten som serveres på skole og SFO.



Mens *staten* kan garantere for at informasjonen fra Helsedirektoratet er trygg og til å stole på, er det ingen som kan garantere oss for dette fra sosiale medier. For å kunne vurdere den informasjonen vi får om matvarer og kosthold, trenger vi kunnskap om *næringsstoffene*, matvarene og om kroppens behov for disse.

Uten mat og drikke, duger helten ikke!

Mat og drikke gir kroppen viktige *næringsstoffer* den trenger for å fungere bra. Karbohydrater, fett og proteiner kalles *energigivende næringsstoffer*. Proteiner kalles for kroppens "byggeklosser".

Når kroppen bryter ned de energigivende næringsstoffene fra maten, gir det oss energi. Denne energien bruker kroppen blant annet til å være i aktivitet og til å vokse.



Vitaminer, mineraler og vann kalles *ikke-energigivende næringsstoffer*. Disse gir ikke kroppen energi, men er helt nødvendige for at kroppen skal fungere optimalt. De er blant annet viktige for synes vårt, for oppbygging av et sterkt skjelett og for å gi oss sterke tenner.

Å ha et *kosthold* som inneholder riktig mengde av de energigivende og de ikke-energigivende næringsstoffene er viktig for at både kroppen og hodet skal fungere bra. Om vi spiser for lite mat kan vi føle oss slappe. Kanskje har du merket at konsentrasjonen blir dårligere og at du orker mindre om du har droppet frokosten eller lunsjen en dag?



Det å gi kroppen riktig mengde næringsstoffer trenger ikke være vanskelig. *Helsedirektoratet* anbefaler et kosthold som består av mye frukt, bær og grønnsaker og *grove kornprodukter*. Litt *meieriprodukter*, kjøtt og fisk er også viktig, og vil *bidra* til å dekke kroppens behov for næringsstoffer. Følger vi Helsedirektoratets

kostråd reduserer vi risikoen vår for å utvikle *livsstilsykdommer* som hjerte- og karsykdommer, diabetes 2 og noen typer kreft.

Det er selvfølgelig lov å unne seg noe godt innimellom. Det viktigste er hva vi spiser i *hverdagen*. Kroppen vår finnes det bare en av, og vi trenger den gjennom hele livet. Det er derfor lurt å ta godt vare på den, fra vi er unge til vi blir gamle.

Sammen for miljøet

I dag er vi over 7 milliarder mennesker på jorda, og vi blir stadig fler. Å *produsere* mat for så mange mennesker er vanskelig, og *matproduksjon* står for en stor del av vårt *klimagassutslipp*. Klimagassutslippene fører til at temperaturen på jorda stiger og dette gjør det vanskeligere å dyrke mat *enkelte steder* i verden. Hver og en av oss kan heldigvis gjøre noe for å redusere denne *belastningen* på jorda. Klimagassutslipp påvirkes ikke bare av at vi kjører mindre bil eller sykler og går mer. Kostholdet vårt har også mye å si, noe vi skal se på her.

Man regner med at ca. 20 %, altså en av fem handleposer med mat som vi kjøper med hjem fra butikken, havner i søppelkassen vår fordi det ikke blir spist. Det er alt for mye, og en stor del av dette matavfallet er brød. Vi kan alle bli flinkere til å kaste mindre mat: Kaster vi stilken på brokkolien eller tilbereder vi den sammen med resten? Benytter vi oss av butikkenes tilbudsdisk over datovarer når vi handler? Eller lager vi en smoothie av den litt brune bananen som ligger igjen i fruktfatet hjemme ... den smaker jo like godt der?



Det å spise mer frukt, bær, grønnsaker, *belgvekster* og kornprodukter og mindre kjøtt er bedre for jordkloden, da det krever mest energi å produsere kjøtt. Dette er også bra for helsen vår og det blir dermed en *vinn/vinn situasjon*! Om vi kjøper mat som er dyrket i Norge, har maten kort reisevei fra jordet til bonden og frem til butikken.

Dette er positivt da det krever mye ressurser å frakte for eksempel et eple fra Italia til Norge.

Hva vi spiser har altså stor betydning for klima og miljø og det er opp til oss alle å gjøre en innsats for å ta vare på jordkloden vår. Kanskje blir det en "restemiddag" i dag?

Valgets kval

Hvilken brus drikker du? Hva pleier du å kjøpe på butikken når du er litt sulten? Hva *styrer* valgene dine? Det vi spiser kan være nøye gjennomtenkt eller veldig tilfeldig.

Se for deg at du er på matbutikken med foreldrene dine: Du har fått beskjed om å hente epler. Du har kanskje allerede bestemt deg for om det



skal være røde, gule eller grønne epler. Du undersøker de for stygge flekker og merker, kjenner om de er faste og fine og du har kanskje sett på prisen og sammenliknet de med noen andre alternativer. Kanskje miljø et viktig

for deg, så du kjøper de norske, *kortreiste eplene*. Eller kanskje lav pris er viktigere, så du tar posen med First-Price eplene, "de er jo gode de og" tenker du. Kanskje endte du også opp med en pose appelsiner, da de sto så fint utstilt, pent pakket inn. På tilbud var de og.

Eksempelet med eplene viser hvor mange valg vi står overfor når det gjelder matvalg. Heldigvis tar vi mange *ubevisste* valg når det kommer til mat, for vi spiser jo gjerne det vi er vant til. Tenk om vi skulle *vurdert* absolutt alle matvalg vi tar i løpet av en dag? Rundt 200 matvalg tar vi daglig, både bevisste og ubevisste. Alt fra hvilket pålegg du vil ha på brødsken, til hvilken drikke du vil ha til middagen.

Ved å kjenne til hvordan matvalgene våre blir påvirket, kan vi kanskje lettere ta bevisste valg. Er det tilfeldig hvor i butikkene ulike matvarer er plassert? Nei. Alle varer har sin bestemte plass og produkter vi bruker mye av, som melk og brød, står alltid langt inne i butikken. På den måten må vi forbi en masse fristelser på veien dit!



I butikkene blir vi fristet med små sjokolader og annet snacks rett ved kassene, slik at vi lett gir etter for *fristelsene* når vi er sultne på vei hjem. Har du lagt merke til dette noen gang?

Jigsaw 9th grade

#sunn

På TV, radio og i sosiale medier som Instagram og Facebook kan vi høre og lese mye om hva slags mat som er sunn, og hvilket *kosthold* som gir god helse. Mye av denne informasjonen varierer fra hvor vi leser om det og det gjør folk forvirret og usikre på hva som er sant. Kan vi stole på det vi blir fortalt?



Noen mennesker, deriblant mange *influencere*, tjener masse penger på at vi følger de på Instagram eller andre sosiale medier. Dette er fordi ulike selskaper betaler disse menneskene for å *reklamere* for produktene deres, og jo flere som følger dem, jo større er sannsynligheten for at flere vil kjøpe deres produkter. Det betyr mange "likes" og penger i kassen til den som publiserer. De blir på denne måten selskapenes levende reklameplakater! Det er lurt å være skeptiske til å kjøpe produkter eller følge spesielle *dietter* som er rettet mot spesielle produkter eller personer. Selger personen som

kommer med disse rådene noen produkter selv? Er innlegget på sosiale medier merket med "reklame" "eller "ad" (reklame på engelsk)? Og er personen som gir disse kostholdsrådene *egnet* til å gi kostråd? Dette er spørsmål vi bør stille oss selv. Noen har kanskje hørt om detox-kurer, kokosfett, Himalayasalt og raw-food?

Med så mye informasjon tilgjengelig, er det viktig å vite hvor vi kan finne troverdig informasjon. "Falske nyheter" og "alternative fakta" er *i vinden* som aldri før!

Noen råd om hva som er et *helsefremmende kosthold* kommer ikke fra noen som ønsker å tjene penger på sine råd. Disse er for eksempel Helsedirektoratets kostråd. Slike *statlige organer* har i oppgave å gi *pålitelige* og *nøytrale* kostråd til befolkningen. Disse rådene er basert på *dokumenterbar kunnskap*, altså kunnskap man har fått gjennom årevis med *forskning*. Denne informasjonen kan vi trygt stole på og bør være *førstevalget* når vi ønsker å vite mer om hva vi bør spise for å ha god helse.



Mens staten kan garantere for at informasjonen vi får fra de statlige organene som *Helsedirektoratet* er nøytral og godt dokumentert, er det ingen som kan garantere oss for nøytral og godt dokumentert informasjon fra ulike sosiale medier. For å kunne vurdere den informasjonen vi får om kosthold trenger vi kunnskap om næringsstoffene, matvarene og om kroppens ernæringsbehov.

Uten mat og drikke, duger helten ikke!

Mat og drikke gir kroppen livsviktige *næringsstoffer* den trenger for å fungere *optimalt*. Karbohydrater, fett og proteiner er *energigivende næringsstoffer*. Proteiner kalles for kroppens "byggeklosser". Når kroppen bryter ned de energigivende næringsstoffene fra maten *frigjøres* det energi. Denne energien bruker kroppen blant annet til å holde kroppen ved like, til bevegelse og til vekst. Når vi bruker like mye energi som vi inntar via mat og drikke sier vi at vi er i *energibalanse*. Fysisk aktivitet og et variert kosthold, gjør det eklere for oss å være i energibalanse.



Vitaminer, mineraler og vann er *ikke-energigivende næringsstoffer*. Disse stoffene gir ikke kroppen energi, men er livsviktige for at kroppens skal fungere optimalt. De er blant annet viktige for synes vårt, for oppbygging av et sterkt skjelett, for å beskytte cellene våre mot skade og til å styrke immunforsvaret vårt.



Å ha et kosthold som inneholder riktig mengder av de energigivende og de ikke-energigivende næringsstoffene, er viktig for at både kroppen og hodet skal fungere godt. Om vi spiser for lite eller får for lite av enkelte næringsstoffer, kan vi føle oss slappe og uvel. Kanskje har du merket at konsentrasjonen blir dårligere og at du orker mindre om du har droppet frokosten eller lunsjen en dag?

Det er ikke slik at vi trenger å regne på hvor mye av hver enkelt matvare vi trenger å spise for å få ha et godt kosthold. Det viktigste er å spise variert og *Helsedirektoratet* anbefaler oss å ha et kosthold som består av mye frukt, bær og grønnsaker og grove kornprodukter. Litt meieriprodukter, kjøtt og fisk er også viktig, og vil bidra til å dekke kroppens behov for næringsstoffer. Følger vi disse kostrådene reduserer vi risikoen vår for å utvikle *livsstilssykdommer* som hjerte- og karsykdommer, diabetes 2 og visse typer kreft. En usunn livsstil øker derimot risikoen for å utvikle disse sykdommene.

Det trenger ikke være komplisert å ha et *helsefremmende kosthold*, og det er lov å unne seg noe godt innimellom. Det viktige er hva vi spiser i *hverdagen*. Kroppen vår finnes det bare en av, og vi trenger den gjennom hele livet. Det er derfor en god investering å ta godt vare på den, fra vi er unge og livet ut.

Sammen for miljøet

I dag er vi over 7 milliarder mennesker på jorda, og vi blir stadig fler. Å produsere mat for så mange mennesker er *belastende* for jordkloden, og matproduksjon står for en stor del av vårt *klimagassutslipp*. Klimagassutslippene fører til at jordens temperatur stiger og dette *truer* jordbruket, og dermed matproduksjonen i mange land. Hver og en av oss kan heldigvis gjøre noen *tiltak* for å redusere denne *påkjeningen* på jorda, og jo flere vi er, jo større blir den positive effekten. Om en person gjør mye, skjer det lite, men om mange gjør litt, skjer det mye! Klimagassutslipp påvirkes ikke bare av mindre bilkjøring og mer sykling og gåing. Kostholdet vårt har også mye å si, noe vi skal se på her.

Man regner med at ca. 20%, altså hver femte handlepose med mat som vi kjøper med hjem fra butikken, havner i søppelkassen vår fordi det ikke blir spist. Det er alt for mye og en stor del av dette matavfallet er brød. *Matsvinn* er noe vi alle kan bidra til å redusere. Kaster vi stilken på brokkolien eller tilbereder vi den sammen med resten? Benytter vi oss av butikkenes tilbudsdisk over datovarer når vi handler? Eller lager vi en smoothie av den litt brune bananen som ligger igjen i fruktfatet hjemme ... den smaker jo like godt der?



Det å spise mer frukt, bær, grønnsaker, *belgvekster* og kornprodukter og mindre kjøtt er bedre for kloden, da det krever mest energi og *ressurser* å produsere kjøtt. Dette er også bra for helsen vår og blir dermed en *vinn/vinn situasjon*! Om vi kjøper mat som er produsert i Norge har maten kort reisevei fra jordet til bonden og frem til



butikken. Dette er positivt, da det krever mye ressurser å frakte en tomat fra Spania til Norge. Kort reisevei for maten gjør også at *næringsinnholdet* er høyere i disse produktene, da innholdet av vitaminer og mineraler gradvis reduseres etter at tomaten, eplet eller agurken plukkes ned fra planten den vokser på. En *vinn/vinn situasjon* her og altså.

Hva vi spiser har altså stor betydning for klima og miljø og det er opp til oss alle å gjøre en innsats for å ta vare på jordkloden vår. Ved å kaste mindre mat eller ved å kjøpe datovarer på tilbud kan vi også spare masse penger, og det er jo fint? kanskje blir det en "restemiddag" i dag?

Valgets kval

Hvilken brus drikker du? Hva pleier du å kjøpe i kantina eller på butikken når du er litt sulten? Hva styrer valgene dine? Å handle mat er kanskje noe vi ikke tenker så mye over. Det vi ender med å ta med hjem kan være nøye gjennomtenkt eller veldig tilfeldig.

Se for deg at du er på matbutikken med foreldrene dine: Du har fått beskjed om å hente epler. Du har kanskje allerede bestemt deg for om det skal være røde, gule



eller grønne epler. Du undersøker de for stygge flekker og merker, kjenner om de er faste og fine og du har kanskje sett på prisen og sammenliknet den med noen andre alternativer. Kanskje miljø et viktig for deg, så du kjøper de norske, *kortreiste* eplene. Eller kanskje lav pris er viktigere, så du tar posen med First-Price epler, "de er jo gode de og" tenker

du. Kanskje endte du også opp med en pose appelsiner, da de sto så fint utstilt, pent pakket inn. På tilbud var de og.

Eksempelet med eplet illustrerer hvor mange valg og *overveielser* vi står overfor når det gjelder matvalg. Heldigvis tar vi mange ubevisste valg når det kommer til mat. Tenk om vi skulle *vurdert* absolutt alle matvalg vi tar i løpet av den dag? Rundt 200 bevisste og ubevisste matvalg tar vi hver dag. Alt fra hvilket pålegg vi vil ha på brødskiven til om du stopper innom butikken på vei hjem fra skolen eller ikke.

Er det tilfeldig hvor i butikkene ulike produkter er plassert tror du? Nei. Butikker har en bestemt oppbygging og produkter vi bruker mye av, som melk og brød, står alltid langt inne i butikken. På den måten må vi forbi mange matvarer på veien og det er større sjanse for at vi blir fristet til å ta med oss noe vi egentlig ikke trengte.

I butikkene blir vi fristet med store tilbudsplakater, kampanjer og plassering av små sjokolader og annet snacks rett ved kassene, slik at vi lettere gir etter for fristelsene når vi er sultne på vei hjem. Har du lagt merke til dette noen gang? Ved å være bevisst på hvordan reklame og markedsføring ønsker å påvirke matvalgene våre, kan vi kanskje lettere ta bevisste og gode valg på butikken.



Questions from the line game

Grønt: 9. og 6. trinn, blått: 9. trinn

Hvor på skalaen tror du dette brødet hører til?

Brødskalaen

Teori:

Merkeordningen “brødskalaen” er utviklet for at man enkelt skal kunne se hvor stor andel grovt mel (sammalt mel, hele korn og kli) brødet inneholder. Målet med merkeordningen er at det skal være lettere for forbrukerne å velge grove kornprodukter, da disse inneholder med vitaminer, mineraler, proteiner, sunt fett og fiber enn de fine typene.

Det er ikke alltid lett å bedømme grovheten på brødet ut i fra utseende. Brød som er mørke i utseende kan være finere enn en tror, og motsatt. Dermed kan brødskalaen være en god hjelp. Sammenlikne prosenten på to ulike brød som har samme symbol. Er prosenten lik?

Spørsmål til videre refleksjon:

- Hvorfor tror du brødet hører til akkurat der du står?
- Hvilket brød ville du ha valgt?
- Synes du det er enkelt å vurdere hvor grovt brødet er bare ut ifra utseende?
- Tror du brødskalaen kan hjelpe folk å velge grove brød?

Hvor grovt brød anbefales Helsedirektoratet oss å spise?

Brødskalaen

Teori:

Ifølge Helsedirektoratets kostrådsanbefalinger bør en “spise grove kornprodukter hver dag”. Dette grovt og ekstra grovt på skalaen. Jo grovere brød, jo bedre er det. I kornprodukter finnes næringsstoffer som fiber, protein, jern og B-vitamin. Jo grovere mel som blir brukt, desto flere viktige næringsstoffer får du i deg. Grovt brød inneholder mer fiber enn loff, og fiber gjør at vi holder oss mette lenger. Holder et stabilt blodsukker.

Spørsmål til videre refleksjon:

- Hva er forskjell på fint og ekstra grovt brød?
- Hvorfor tror dere det anbefales å spise grovt brød?
- Hav skal til for at du velger å kjøpe grovt brød?

Mine omgivelser påvirker mine matvalg

Enig → uenig

Spørsmål til videre refleksjon:

- Spør hvorfor de har plassert seg der de har plassert seg
- Hva kan påvirke matvalgene våre?
 - Venner, familie, tilbud, tilgjengelighet
- På hvilken måte påvirker butikker hva vi ender med å kjøpe?
- Hvordan kan vi minimere hvor mye vi lar plassering i butikk og reklame påvirke oss?

Det kostholdet du har som barn og ungdom har betydning for helsen din når du blir gammel

Enig → uenig

Teori:

Sunn mat er mat som samsvarer med myndighetene kostholdsråd. Mye frukt, grønnsaker, bær, bønner og linser av ulike typer, og noe animalske produkter (si hva det er). Kosthold er den viktigste påvirkningen på helse for oss nordmenn. Før var røyking det som gav oss mest sykdom, nå er det et usunt kosthold. Den helsen du har kan påvirke helsen til dine barn og barnebarn! Mye vegetabiliske varer forebygger livstilssykdommer, og mye rødt kjøtt og bearbeidet kjøtt øker.

Spørsmål til refleksjon:

- Hva er egentlig sunn mat?
- Tenker du over hva du spiser?
- Hvilke positive konsekvenser kan det komme av å ha et sunt kosthold?
- Helse til neste generasjon?

Det er dyrt å spise sunn mat

Enig → uenig

Teori:

mye sunn mat er dyrt. På bensinstasjon, fast Food-kjeder og i butikken finner vi masse billig og usunn mat. Grov spagetti er dyrere enn vanlig, og kyllingfilet er dyrere enn pølser. Men grønnsaker, frukt og belgfrukter er sunn og billig mat om vi ser på kiloprisen.

Spørsmål til refleksjon:

- Hvilken sunn mat er dyr?
- Hvilken sunn mat er billig?
- Er den hjemmelagde maten oftest dyrere eller billigere enn den ferdiglagde fra butikken?
- Hvordan kan man spise sunt, men billig?

Det er farlig å spise mat som har gått ut på dato

enig → uenig

Teori:

Matvarer som er merket med "best før"- dato er som regel ikke farlig å spise etter at datoen er gått ut. En huskeregel for å sjekke om matvaren fortsatt kan spises er: se, lukt, smak! Dersom melka både ser, lukter og smaker greit kan den drikkes etter datoen er gått ut. Et forsøk gjort av Opplysningskontoret for Meieriprodukter (melk.no), viste at en melk fortsatt var brukbar etter å ha stått åpnet i kjøleskapet i 40 dager. "Om lag en halv million nordmenn velger å helle ut melken når datoen er passert" (melk.no)

Spørsmål til refleksjon:

- Hva er forskjellen på "best før" og "siste forbruksdag" på matvarer?
- Hvordan kan man vurdere om mat fortsatt er spiselig?

Å spise frokost er viktig

enig → uenig

Teori:

Frokost er viktig for å gi energi og øke konsentrasjonen. Det er viktig å spise måltider med jevne mellomrom for å holde et stabilt blodsukker og holde konsentrasjon og energi oppe. Mat som en kan velge til frokost er for eksempel grovbrød med ulike typer pålegg, havregrøt, yoghurt (med lite sukker) osv. Spis også gjerne en frukt eller grønnsak til måltidet. Studier har også sett positive assosiasjoner mellom frokostspising og BMI og karakterer

Spørsmål til refleksjon:

- Til de som står på "enig siden": På hvilken måte er frokost viktig?
- Merker du forskjell om du ikke har spist frokost en morgen? Evt. hvilken forskjell merker du?
- Forskning sier at det er viktig med frokost. Hvorfor tror dere det er slik?
- Til de som står nærmest "uenig" siden: Hva skal til for at du plasserer deg nærmere "enig" siden?

Det er sunnere å spise brunt sukker enn hvitt sukker (kan stilles om dette er noe elevene kjenner til)

Enig → uenig

Det er ingen forskjell hva man velger. førstnevnte inneholder bittesmå mengder mer av noen næringsstoffer, men det er så små mengder at vi måtte spist enorme mengder før det skal gi utslag. Da vil de negative konsekvensene av mye salt og sukker være mye verre. Ikke minst er førstnevnte MYE dyrere

- Hva har dere hørt om disse produktene?
- Smaker de noe annerledes?
- Har vi en type salt som er bedre enn enkelte andre?
 - Natriumreduert Seltin eller Jozo

Det er sunnere å spise ferske grønnsaker enn frosne grønnsaker (brukes mandag og tirsdag → de som ikke har 5 om dagen aktiviteten)

Enig → uenig

Etter at man har høstet frukt, bær og grønnsaker synker næringsinnholdet for hver dag som går. Frosne grønnsaker er frosset raskt ned etter innhøsting og det bevarer næringsinnholdet bedre enn om de ligger i romtemperatur (disse ligger ofte lenge før de havner på vår tallerken). Derfor er innholdet av vitaminer og mineraler ofte høyere i frosne. Både frosne grønnsaker og hermetiske grønnsaker inngår i anbefalingene om 5 om dagen.

- Hva kan påvirke næringsinnholdet til grønnsaker?
 - Temperatur (koking, steking, forvelling, baking), lang oppbevaring
- Er frosne eller ferske grønnsaker dyrest?
 - Ofte de ferske

Fett er farlig

Enig → uenig

Vi har forskjellig fett i mat. Mettet fett og transfett bør vi begrense inntaket av. Mettet fett og transfett finnes først og fremst i animalske produkter, kokosfett og palmefett og godteri og kjeks/snacks som er fritert. Umettet fett er bedre for kroppen, og noen er også helt nødvendige. Umettet fett finner vi i nøtter, oljer, margarin, fisk og i fete frukter som avokado. Vi bør byttet ut mettet fett med umettet fett. Flerumettet fett, som omega 3, klarer ikke kroppen å lage selv, og vi er nødt til å få det i oss gjennom kostholdet.

- Hva er fett?
 - Viktig energikilde nødvendig for kroppen, isolasjon, essensielle fettsyrer
- Hvilke oppgaver har fett i maten?
 - Smak, konsistens og bærer av fettløselige vitaminer
- Hvilke typer fett har vi og hva er forskjellen på dem?
- Hvor finner vi det sunne fettet?

Questions for the 50-game

23

Hvor mange porsjoner
frukt, bær og grønnsaker
bør vi spise hver dag?



3

Alle skal ta fem
froskehopp



2

Gi to gode grunner til at
vann er den beste
tørstedrikken



4

Alle skal stille seg på en
linje, fra størst
skostørrelse til minst



32

Hva viser brødskalaen
oss?



22

Syng "Ja, vi elsker"



7

Hvilken råvare er kjent
for å inneholde mest
omega 3?



50

Hvordan kan vi bli flinkere
til å kaste mindre mat?



12

Hvor finner vi informasjon om hvor mye fett eller karbohydrater matvarer inneholder?



10

Alle må si "gratulerer med dagen" i kor til den av dere som har bursdag neste gang



11

Hva kan skje med tennene våre dersom vi spiser mye sukker?



9

Gi eksempler på minst tre frukter og tre grønnsaker som vokser i Norge?



13

Nevnt minst fire matvarer/drikke vi bør begrense inntaket av?



16

Hva er forskjellen på naturellyoghurt og fruktyoghurt når det gjelder næringsinnhold?



15

Hvorfor er frukt og grønnsaker bra for oss?



14

Hvor mange milliliter (ml) er 1 desiliter (dl)?

- 10ml
- 100ml
- 1000ml



20

Fleip eller fakta:
Nøtter inneholder mye
fett og er derfor ikke
sunt



18

Hvordan kan vi beskytte
oss mot farlige bakterier
i maten?



19

Nevnt minst to grunner
til at banan er fin mat
"på farta"



17

Hvilke av disse
næringsstoffene kalles for
kroppens "byggeklosser"

- Fett
- Karbohydrater
- Proteiner



21

Hva er livsstilssykdommer?



6

Alle plasserer seg på en linje etter navn som begynner fra A til Å



1

Hvilke av disse næringsstoffene gir IKKE energi?

- Proteiner
- Vitaminer
- Fett



24

Hvorfor er det oftest bedre å lage mat fra bunnen av fremfor å kjøpe ferdig?



30

Tell til 10 på engelsk



26

Hvordan kan man lage en sunn pizza?



28

Hvor grovt brød (når vi ser på brødskalaen) bør vi velge i butikken?



31

Alle stiller seg på rekke der den eldste står bak og den yngste fremst



25

Alle må si to nye ting de
har lært i dag



29

Hvilke organer består
fordøyelsessystemet av?



5

Bør vi spise/drikke
meieriprodukter med mye
eller lite fett?



33

Syng en norsk sang (som
ikke er nasjonalsangen
vår)



34

Hvilke fem grunnsmaker finnes det?



35

Hvor mange matvalg tar vi hver dag?



40

Nevn 3 fordeler ved å spise frokost?



37

Hvordan kan vi spise mer miljøvennlig?



38

Hvor mange øyne/prikker er det til sammen på en terning?



39

Hvordan kan vi kjenne det på kroppen at vi har fått i oss for lite mat?



36

Bær en på gruppa tilbake til terningene



41

Hvorfor er det ikke det samme å spise en hel appelsin som det å drikke appelsinjuice?



42

Nevn 3 matvarer som begynner på K



48

Hva viser tallerkenmodellen oss?

- Hvor mange tallerkener vi bør spise til middag
- Hvordan vi bør sette sammen et næringsrikt måltid
- Hvor grovt et brød er



44

Hva skjer om vi baker brød uten gjær?



45

Hvordan bør en spise ifølge tallerkenmodellen?



46

Hvilket energigivende næringsstoff vil kroppen helst bruke som energikilde?



47

Nevn tre ting som påvirker hva vi spiser



43

Hva er umami?



49

Hvorfor er det viktig å få i seg nok mat?



8

Ved hvilken årstid kan vi plukke sopp i skogen i Norge?

- vår
- sommer
- høst
- vinter



27

Gi eksempler på god bordskikk

