

Teaching critical thinking about health claims: market analysis for Norwegian primary and lower secondary school

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Colophon

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Plain language summary

The purpose of this study was to explore in Norwegian primary and secondary schools: the demand for learning resources for teaching students to think critically about health claims and choices; where teaching these skills best fits in the curriculum; and market conditions for introducing this into schools, including the availability of time, who the decision-makers are, and what influences their decisions.

We reviewed relevant documents, and interviewed teachers and other key stakeholders. The documents we reviewed were primarily related to a new curriculum in Norway, which will be implemented in the fall of 2020.

Key findings

These key findings have important implications for the design and implementation of learning resources to teach critical thinking about health.

- Implementation of the new national curriculum offers an opportunity to introduce new learning resources. The new curriculum emphasises critical thinking and health.
- There is limited classroom time for teaching and there are many demands on the time that is available.
- Teachers and other stakeholders desire interdisciplinary collaboration (teaching across subjects) generally and specifically for critical thinking about health. However, it is unlikely that classroom time will be allocated to this in two of the three subjects where critical thinking about health is a core element (Food & Health and Physical Education). It is more likely for Science.
- Teachers have little time to seek and test new learning resources. They also may lack competence and confidence in their own ability to assess health claims. They are unlikely to have experience teaching critical thinking about health.
- There is variation in what is taught and how it is taught across schools, subjects, and teachers.
- Teachers have a great deal of discretion and make many decisions about what and how they teach.

Abstract

Objectives: We explored the following in Norwegian primary and secondary schools: the demand for learning resources for teaching students to think critically about health claims and choices; where teaching these skills best fits in the curriculum; and market conditions for introducing this into schools, including the availability of time, who the decision-makers are, and what influences their decisions.

Methods: We conducted a document analysis and semi-structured interviews. We analysed key documents related to current practice and the development of a new national curriculum in Norway that will be implemented in the fall of 2020. We interviewed 12 primary and lower secondary school teachers (grades 1 to 10), two principals, one policymaker, and one provider of Science learning resources. We used an interpretative description approach.

Findings: Key findings related to the demand for teaching critical thinking about health and learning resources, decision makers, where teaching critical thinking about health fits into the curriculum, and implementation considerations. There is general agreement that teaching critical appraisal of health claims should be prioritized more than it currently is and there is a need for learning resources to support this. Teachers have a great deal of discretion and make many decisions about what to teach, how, and with what learning resources. Critical thinking about health is relevant for three subjects - Food & Health, Physical Education, and Science - but there is limited if any time for classroom teaching in the first two subjects. Learning resources should be easy to use, support teachers who do not have training or experience teaching this, and should facilitate collaboration across subjects and across grades.

Conclusions: Use of learning resources to teach critical thinking about health should require as little classroom time as possible. They should be designed primarily with and for Science teachers, but should facilitate coordination across subjects and relevant activities in other subjects.

Background

The **Informed Health Choices** (IHC) project is an international collaboration with the aim of enabling people to assess claims about the effects of treatments and to make informed health choices. ‘Treatment’ includes any action that is intended to improve the health of individuals or communities. In this report we use “critical thinking about health” as shorthand for these abilities.

The IHC project has developed and evaluated resources for teaching 12 Key Concepts to primary school students [1]. These resources include a textbook and a teachers’ guide. The textbook includes a comic book story that explains the concepts, exercises, and classroom activities. Pilot and user testing show that students and teachers perceive these resources to be useful. Use of the resources was shown to be effective in a randomised trial with over 10,000 students in Uganda [1], and the students retained what they learned for at least one year [2]. The resources are also being used at an international school in Norway, where they were pilot tested.

The objectives of this study were to explore:

- the demand for learning resources for teaching critical thinking about health in Norwegian primary and secondary schools;
- where teaching these skills best fits in the curriculum; and
- market conditions for introducing this into schools, including the availability of time, competing demands on time and resources, who the decision-makers are, and the factors that influence their decisions.

Methods

We undertook a document analysis and semi-structured interviews with teachers and other key stakeholders.

Document analysis

The Norwegian national curriculum for primary and secondary education is being revised and the new curriculum is expected to be finalised in 2019. We reviewed key documents describing the new curriculum. We looked for indications of the importance given to critical thinking and health. We also considered other ways in which proposals for the new curriculum might affect conditions for introducing critical thinking about health claims and choices into primary and secondary schools.

In addition, we reviewed science textbooks and commonly used online learning resources. These were identified by the teachers that we interviewed. We examined the extent to which these include resources for learning to think critically about health.

Semi-structured interviews

We used an interpretative description approach [3] to explore demand, opportunities, and market conditions for introducing teaching of critical thinking in relation to health. This approach borrows from grounded theory, naturalistic inquiry, and ethnography. It differs from these approaches in that the investigators are looking for findings with practical applications. Samples are purposely generated, reflecting an awareness of expected and emerging variations within the phenomenon under study. Various verification strategies, such as concurrent data collection and analysis, constant comparative analysis and iterative analysis, serve to locate the findings within the framework of the existing body of knowledge. The product of an interpretive description, or the object of the exercise, is a coherent conceptual description that informs assessment, planning and intervention strategies.

Sampling

We initially considered interviewing multiple stakeholders, including teachers, principals, policymakers, publishers, and parents. Through personal contacts of the research team, we generated a list of potential participants that included teachers, principals, and parents from primary, lower and upper secondary schools. Pilot interviews with teachers and principals indicated that key decisions were made largely by teachers and that the interviews with principals did not reveal information that was substantially different from what was obtained from teachers. We therefore did not interview additional principals. We also concluded that interviews with parents would be unlikely to be helpful. The one interview that we conducted with a policymaker reinforced our impression that we should focus on teachers. After completing interviews with the teachers and other stakeholders, we interviewed one provider of learning resources for Science, who confirmed previous findings.

We decided that we would restrict our focus to primary (grade 1 to 7) and lower secondary schools (grade 8 to 10) after the pilot interviews. There were two reasons for this. First, our primary interest was in younger children. It would be desirable to continue to reinforce and build on what is learned in primary school as part of a spiral curriculum [4,5] that continues through upper secondary school. However, it becomes increasingly difficult to teach critical thinking about health if there is not a foundation on which to build [1,6]. Second, the upper secondary school market is much more complex. The paths that students take in upper secondary school are much more diverse than in lower secondary school and there is more diversity among schools.

Based on the document analysis and the pilot interviews, we focused on teachers who taught three subjects: Science, Food & Health, and Physical Education. We had planned on interviewing up to 35 people, but after interviewing 12 teachers, we concluded that additional interviews with teachers were unlikely to be helpful. We were unable to arrange an interview with a publisher. Characteristics of the teachers whom we interviewed are summarised in Table 1.

Table 1. Characteristics of the teachers that were interviewed

<i>Geographic area</i>	<i>n</i>	<i>Subject area</i>	<i>n</i>
Eastern	9	Science	8
Northern	2	Science + Food & Health	1
Western	1	Science + Physical Education	1
Southern	0	Science, Food & Health, and Physical Education	2

Table 1. Characteristics of the teachers that were interviewed - continued			
Size of municipality (population)	n	School size (students)	n
More than 50 000	8	More than 300	10
5000 to 49 999	4	100 to 300	2
Type of school	n	Grade	n
Primary	3	1 to 3	4
Lower secondary	6	4 to 7	2
Combined primary and lower secondary	3	8 to 10	6
Teacher's age	n	Sex	n
20 to 29	3	Female	10
30 to 39	2	Male	2
40 to 49	2		
50 to 59	3		
Unknown	2		
Teaching experience (years)	n	Length of interview (minutes)	n
0 to 4	2	15 to 20	2
5 to 9	1	21 to 30	5
10 to 19	1	31 to 40	2
Unknown	8	41 to 50	3

Data collection

Five interviewers conducted 15 interviews between February and June 2018. The Interviewers were students working in **StudConsult**, a consulting firm run by both Masters and Bachelor students at the Norwegian Business School (BI). The students did not have any prior exposure to the IHC project. They all attended primary and secondary school in Norway and recruited teachers and the two principals through personal contacts and contacts of colleagues. The interviewers did not interview teachers or principals that they knew prior to the interview.

Interview guides were developed by StudConsult together with two members of the IHC group. The interview guide for teachers included questions about:

- the teacher,
- the extent to which critical thinking is taught,
- the content and amount of time available for the subjects taught by the teacher,

- what learning resources are used, how decisions are made about what to use, and their preferences for different types of learning resources; and
- challenges for teaching critical thinking about health claims

Minor modifications were made to the interview guide as needed based on analysis of the prior interviews.

The participants were encouraged to speak freely and allowed to lead the interview in the direction they found most interesting and important. The length of the interviews varied from 16 to 42 minutes, depending on how much the participants had to say. A link to the [IHC primary school resources](#) was sent to the participants in advance of the interviews and at the end of the interview, we asked what they thought about those. However, the teachers did not find time to do this and questions about those resources did not yield useful information.

One interview was conducted face-to-face. The rest were telephone interviews. Two interviewers participated in each interview, with one responsible for the conversation and the other responsible for taking notes. All interviews were recorded and transcribed.

Data analysis

Each interview was coded soon after it was conducted. The first four interviews were coded by pairs of students to ensure that all of the research team was familiar with the coding system. In addition, two interviews were coded on two different occasions, to ensure reproducibility. Twelve main findings emerged from the initial interviews, which were grouped in four categories. Subsequent interviews supported and enriched those findings.

Ethical considerations

A protocol for the study was approved by the Data Protection Officer at the Norwegian Institute of Public Health who approved the study prior to data collection. We sent an email message to each participant prior to the interview informing them that we would record the interview and that the recording would be deleted within one year. Participants were told that they could end the interview at any time and could ask for the recording to be deleted at any time. They were also given contact details for the Centre for Informed Health Choices at the Norwegian Institute of Public Health, which commissioned the study. Recordings and transcripts were made anonymous and were stored in a password protected file.

Results

Document analysis

The national curriculum

The documents that we reviewed are summarised in Table 2.

Table 2. Description of the documents that were reviewed

Document	Description
Critical appraisal of health claims: science teachers' perceptions and practices, 2016. [7]	A qualitative study of lower secondary school science teachers' perceptions and reported practices related to teaching critical appraisal of health claims. The interviews were conducted between November 2012 and April 2013.
Students' learning in the future's school - a knowledge base, 2014. [8]	An Official Norwegian Report commissioned by the Ministry of Education and Research, which reviewed the subjects taught as part of a basic education in Norway in relation to demands for competence in future social and working life. This report laid the groundwork for the new curriculum in Norway.
The future's school - renewal of subjects and competences, 2015. [9]	A second Official Norwegian Report commissioned by the Ministry of Education and Research, which assessed which competences will be important for students in the future, and the changes that must be made in subjects taught as part of a basic education in Norway in order for students to develop those skills.
Subjects - Deepening - Understanding - A renewal of the Knowledge Promise, 2015-2016. [10]	A report to the Norwegian parliament by the government in which the government proposes how the content of primary and secondary education should be renewed in order for children and young people to have good conditions for developing values, knowledge and attitudes that are of major importance in their lives.
Strategy for renewal of subjects, 2017. [11]	A Norwegian Department of Education and Research report describing the key phases in renewing the national curriculum.
The final core elements of the new curriculum, 2018. [12]	The core elements of the new curriculum decided on by the Department of Education and Research after three rounds of feedback on draft core elements.

The current science curriculum in Norway specifies that critical appraisal of health information is important in order to take responsibility of your own body and for physical and mental health [13]: "Body, health, lifestyle and nutrition are frequently mentioned in the media. Knowledge and critical assessment of information in this area is important to be able to take responsibility for your own

body, and for physical and mental health.” However, critical appraisal of health claims is not being taught or learned [7,14]. Reasons for this include that science teachers are not attentive to opportunities for teaching critical appraisal of health claims, they prioritise teaching content knowledge, and they have limited ability to critically appraise health claims themselves. Consequently, they are likely to need support.

The ability to “critically assess how information is conveyed and used in arguments” is identified as a key competence in the current science curriculum [13]. The ability to “critically assess” information is described as the ability to identify relevant information and assess the credibility of the *source*. This is commonly referred to as “source criticism” - the focus being on assessing the source of a claim, rather than assessing the basis for a claim or the reliability of the evidence used to support a claim.

The new curriculum prioritises three interdisciplinary topics: democracy and citizenship, sustainable development, and public health and coping skills. Both an individual and a societal perspective are emphasised for health. Health is a core element in three subjects: Science, Food & Health, and Physical Education.

There is a heavy emphasis on the ability to think critically throughout. “An important principle for the 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.”

In the third draft of the core elements for Science [15], it is noted that: “Science knowledge can enhance the student's ability to make conscious choices and critically evaluate information.” The body as a system is also included as a core element. However, critical thinking about health is not specifically identified as a core element.

Critical thinking is also a core element for Food & Health, and critical appraisal of online information about nutrition is specified. Critical thinking about physical activity in relation to health is a core element for Physical Education.

In summary, health is prioritised as an interdisciplinary topic and there is a heavy emphasis on critical thinking in all of the background documentation for the new curriculum. However, at this stage of development, there is not a coherent plan for incorporating critical thinking about health in the new curriculum. It is unclear how this will be coordinated across the three subjects where this is relevant. Further development is underway now and the new curriculum is expected to be completed next year. After this, schools will prepare for the new curriculum and begin to use it starting in the fall of 2020 [16].

Learning resources

The textbooks used in Science in Norwegian primary and lower secondary schools, which were identified by the teachers that we interviewed, are listed in Table 3. None of these include material on critical thinking about health. Online learning resources that the teachers identified are listed in Table 4. These also do not include critical thinking about health.

Table 3. Primary and lower secondary school science textbooks

Grades	Textbook	Years published	Publisher
1 to 4	Cumulus	2006, 2007, 2008	Aschehoug
4 to 7	Gaia	2014, 2015	Gyldendal
5 to 7	Yggdrasil	2006, 2007, 2008	Aschehoug
8 to 10	Eureka	2006	Gyldendal
8 to 10	Nova	2013	Cappelen Damm
8 to 10	Tellus	2006, 2007, 2008	Aschehoug

Table 4. Online learning resources

Name	Subject	Content
Kraftskolen.no	Science	Videos about energy
Naturfag.no	Science	Suggestions for experiments, science articles, videos, lesson plans, and other learning resources
Nysgjerrigper.no	Science	Suggestions for experiments; a science magazine; a research competition; and guides, lesson plans, and tips for teachers
Salaby.no	Food & Health, Physical Education, Science	Content for the entire span of primary school education, including for classwork (on interactive whiteboards or projected) and for individual activity (in-depth learning or group work on a computer or tablet)

Interviews

The teachers and others that we interviewed were aware of the emphasis on critical thinking in the new curriculum. The main findings from the interviews are summarised in Table 4.

Table 4. Summary of main findings from the interviews

Demand for teaching critical thinking about health and for learning resources	<ul style="list-style-type: none">• Teachers feel that teaching critical appraisal of health claims should be prioritised in school more than it is today.• There is also external pressure to teach this.• There is a need for learning resources for teaching this.
Decision makers	<ul style="list-style-type: none">• Teachers must make sure to cover the competency aims for their subjects, but have a great deal of discretion in deciding how to do this.• Schools decide which textbooks to buy, but the teachers often must use additional learning resources to cover competency aims.• Teachers decisions about what resources to use are influenced by social networks, including Facebook groups.
Where teaching critical thinking about health might fit into the curriculum	<ul style="list-style-type: none">• Teachers feel that Physical education and Food & health should be used for activities, with very little time devoted to classroom teaching.• Critical thinking is a core component of Science, but the amount of time devoted to teaching this varies.• Although critical thinking is also supposed to be a core component of Physical education and Food & health, the time used for teaching critical thinking skills is very limited to none.
Implementation	<ul style="list-style-type: none">• User-friendly teaching resources are needed.• Some, teachers believe that critical appraisal of health claims should be taught beginning early in primary school, but some disagree with this.• Interdisciplinary collaboration is desired generally and specifically for teaching critical appraisal of health claims.

Demand for teaching critical thinking about health and for learning resources

The teachers that we interviewed recognised the importance of teaching students to critically appraise health claims. When we asked them if they believe the focus on critical thinking in the Norwegian schools is sufficient, 10 out of 12 answered that critical thinking should be emphasized more. As noted by one teacher:

“Critical thinking should be just as important as writing and calculating are in all other subjects.”

Several teachers noted that with increased digitalization and use of social media, there is a need for the students to learn how to critically assess and evaluate the information that they access from various sources. They expressed concerns about the students’ ability to appraise information that they find on the internet, especially claims about diet and nutrition. This is exemplified by this statement by one of the teachers:

“We rarely discuss how health claims can be critically assessed and evaluated. Most of the students fail to understand that a blog written by someone at their age is not always reliable.”

The teachers were uncertain about how much time in the new curriculum will be available for teaching critical thinking. Although changes to their current practice appear likely, and it appears that more emphasis will be given to teaching critical thinking skills, it is unclear what might be removed from what they currently teach to allow more time for teaching critical thinking skills.

The national curriculum directs what the teachers should cover in their classes, but teachers have a great deal of discretion in deciding how they structure their classes, what teaching material they use, and which topics they cover. When we asked the policymaker that we interviewed about how the new curriculum is going to be implemented, he explained that the Directorate for Education and Training does

“not have anything to do with how the implementation is done at each school. When the new national curriculum is introduced, the schools and the teachers have to discuss what it means and how it should be interpreted. The national curriculum does not give a specific guide to content, but rather a direction.”

One of the principals that we interviewed explained that it is difficult to comply to a new curriculum that has not yet been introduced, but that the school has taken some measures to be prepared:

“We divided the curriculum into several paragraphs that the teachers had to get familiar with. Later on, the teachers had to present each paragraph to each other. The content in the presentation was used to make an educational program called “Learning and joy” which lasted for the first three weeks of school. The teachers and I have also worked in teams to review what we currently know about the new curriculum.”

It was clear that there is a lack of resources for teaching critical appraisal of health claims. In Food & Health, most schools provide the students with a book of recipes, *Fra Boller til Burritos*, a book that only to a limited extent initiates discussion about diet and nutrition. In Physical Education, teachers reported that no books are provided by the schools, and that online learning resources are only utilized to a limited extent. For Science, there are several options for textbooks (Table 3). Several teachers reported that the textbooks do not sufficiently cover the curriculum, and that they frequently have to develop their own material or use other online resources. One teacher noted:

"It is not possible to follow both the curriculum and the book at the same time."

None of the teachers were able to identify resources that are aimed specifically at teaching critical appraisal of health claims. Teachers have a limited amount of teaching hours for each subject and limited time to prepare. Several teachers noted that this affects their willingness look for and test new learning resources. Implementation of the new national curriculum may facilitate giving teachers time to reflect on how they are currently using their classroom time and to look for and test new learning resources.

Decision makers

While school administrations decide which textbooks to purchase, teachers decide how to use the textbooks. The teachers identified six textbooks that are used in Science (Table 3). The teachers noted that in some cases each student does not have a textbook, only the teacher does. The teachers also decide which additional learning resources to use, and they frequently use online resources such as those listed in Table 4.

There appeared to be some variation from school to school and across subjects. Food & Health and Physical Education teachers seem to have more freedom to structure their classes. There also seems to be more coordination among science teachers, as noted by one teacher:

"Science teachers and the school coordinator for Science work together to decide what resources to use."

Each class has a homeroom teacher who typically follows the same group of students over several years, and is responsible for continuity from year to year in subjects such as Science. There is variation in the number of subjects that homeroom teachers teach. When the same teacher follows students over several years, this reduces the need for coordination between teachers across grades.

There appears to be variation among schools regarding coordination of decision-making across subjects and grades. Some schools have teacher teams and subject groups. In one school, for example:

"Several teachers work together in teams to decide distribution of the number of hours for each topic."

Thus, while teachers have a great deal of discretion, there is variation from school to school and within schools from subject to subject. There is also

variation in what influences teachers' decisions about how to implement the curriculum and what learning resources to use. Teachers indicated that the textbooks they used, the online resources that they found or with which they were familiar, and social networks influenced their decisions. The teachers identified two Facebook groups: "Undervisningsopplegg" with 10 800 members and "Undervisningstips" with 21 000 members. The aim of both of these groups is to exchange ideas and experiences about lesson plans, learning resources, and teaching tips. Teachers from all over the country share links, ideas, challenges, and teaching material.

Where teaching critical thinking about health might fit into the curriculum

Several teachers said that the teaching hours allocated to Food & Health and Physical Education are devoted to activities such as sports and cooking, rather than classroom teaching. They stressed that the students look forward to these subjects because of this. Several teachers argued that time should not be taken away from activities in these subjects for classroom teaching. The teachers argued that the aim of Physical Education should be for the students to be active and to learn about different sports and types of physical activity. For example, one teacher said:

"The most important part about teaching Physical Education in primary school is to make the students like being in activity and start engaging in sports."

In contrast, Science is mostly classroom teaching, although teachers noted that they try to incorporate activities, for example, by working on projects and using online learning resources. Critical assessment of information is a core element of Science. There were differences in how much emphasis the teachers place on this, but most agreed that it should be emphasised more.

All of the teachers noted that they are constrained by the limited amount of teaching hours together with a growing curriculum. The time they have to prepare is also limited. One teacher noted that:

"Some teachers fall into a pattern and continue with the teaching material that they have always used. Starting with something new usually takes some time. . . . The teachers have too many roles to fill, and too little time."

There is large variation in the average number of hours available for teaching different subjects, both across schools and across grades. On average, Food & Health and Science are each taught approximately 2.5 hours per week each year,

but Food & Health is only taught for two years. Physical Education is taught approximately 2 hours per week on average.

There may be changes in the framework regulating the distribution of time across subjects when new curriculum is introduced.

Implementation

Several teachers indicated they would prefer digital learning resources rather than textbooks, as this helps to ensure that the material is up-to-date. However, none of the schools represented by the teachers that we interviewed used tablets in their classes.

Activities such as classroom discussions, role play, games, or experiments were frequently brought up as teaching methods that students appreciate. Most of the teachers indicated that they prefer a mix of learning resources and teaching methods, such as having the students read something followed by an activity.

Most of the teachers wanted learning resources that are easy to use and that include a teachers' manual and suggestions for activities. Some of the teachers indicated that 'critical appraisal of health claims' training for teachers would be helpful.

Some of the teachers suggested that teaching critical appraisal of health claims should begin at the earliest age possible. One teacher even argued that it should be taught from kindergarten. The main reason given for starting early was that it becomes embedded in the students' way of thinking, and they will be able to apply the principles later on. On the other hand, other teachers suggested that critical appraisal of health claims should not be taught until the end of primary school or in secondary school. They expressed concerns about students not being mature enough to understand this from an early age.

Several teachers expressed the need for more interdisciplinary collaboration, and project-based work. One teacher said:

"We need more interdisciplinary collaboration, so we can have bigger projects. There should be more team-based learning, and less subject specific."

Other arguments put forward for interdisciplinary learning were that it can facilitate in-depth learning and enable the students to transfer knowledge from one field of study to another.

Some of the teachers noted that public health and wellbeing is a prioritised interdisciplinary topic in the new curriculum, and that critical appraisal of health claims would fit under that topic.

Discussion

There is broad agreement among teachers that more emphasis should be given to teaching critical thinking about health, and there is a demand for learning resources to help implement this. Critical thinking about health is not specifically identified as a core element in the new curriculum, but critical thinking is emphasised as an important competence and health is a prioritised interdisciplinary topic. This may increase the demand for learning resources. Implementation of the new curriculum by schools may offer a good opportunity for introducing new learning resources.

Individual teachers have a great deal of discretion and are key decision-makers in terms of what learning resources are used and, to some extent, how much time is used for teaching critical thinking about health. They want learning resources that are easy to use and that provide them with sufficient support to teach critical appraisal of health claims. They would prefer more interdisciplinary teaching generally and specifically for critical thinking skills. They are most likely to seek and test out learning resources that can be found on one of the online sources with which they are familiar and through Facebook groups and other social networks.

The age at which teaching critical thinking about health should begin is uncertain, but it should begin in primary school. It is relevant for Food & Health, Physical Education, and Science. Although it may be preferable to teach this as an interdisciplinary topic across these subjects, very little time in the first two subjects is allocated to classroom teaching and it appears unlikely that this will change. Therefore, it is logical to incorporate critical thinking about health in Science and for Science teachers to take the lead in coordinating interdisciplinary teaching, including relevant activities in Food & Health and Physical Education.

Implications

Key implications for the design and implementation of learning resources to support teaching students to think critically about health are summarised in Table 5.

Table 5. Implications	
Findings	Implications
An important question that this study does not answer is how much time is likely to be allocated to teaching critical thinking about health.	The answer to this question has major implication for designing learning resources. Therefore, answering this question should be a priority.
There is limited classroom time for teaching and there are many demands on the time that is available.	Use of the learning resources should require as little classroom time as possible. They also should be designed to be used over more than one grade and to facilitate collaboration across grades.
Implementation of the new national curriculum offers an opportunity to introduce new learning resources.	It may be advantageous to have learning resources ready close to the time when the new curriculum is being implemented, although this may not be possible.
The new curriculum emphasises critical thinking and health.	Linking learning resources to core elements of the new curriculum may help to promote their use.
Teachers and other stakeholders desire interdisciplinary collaboration (teaching across subjects) generally and specifically for critical thinking and health. However, it is unlikely that classroom time will be allocated to this in two of the three subjects where critical thinking about health is a core element (Food & Health and Physical Education). It is more likely for Science.	Learning resources should be designed primarily for Science teachers. However, so far as possible, they should include activities for Food & Health and for Physical Education; and they should facilitate collaboration across subjects.
Teachers have little time to seek and test new learning resources. They also may lack competence and confidence in their own ability to assess health claims. They are unlikely to have experience teaching critical thinking about health.	The learning resources should be designed to be easy to find; e.g. by hosting them on naturfag.no and by informing Facebook groups of their existence. They should be easy to understand and use; e.g. by providing scaffolding for both teachers and students.
In the current Science curriculum, the ability to “critically assess” information is described as the ability to identify relevant information and assess the credibility of the source	Some teachers may confuse “source criticism” with critical appraisal of the basis for claims and the evidence supporting claims. This difference should be made clear in learning resources and promotional materials.
Primary and secondary schools use several different science textbooks, none of which are comprehensive and none of which cover critical thinking about health.	Consideration should be given to how best to link learning resources for critical thinking about health to the textbooks that are widely used in Norway.
There is variation in what is taught and how it is taught across schools, subjects, and teachers.	So far as possible, use of the learning resources should be flexible, so as to accommodate the needs of different teachers.
Teachers have a great deal of discretion and make many decisions about what and how they teach.	Teachers should be engaged in designing the learning resources.

Conclusion

The availability of classroom time and teachers' time to prepare are likely to be the most important barrier to uptake of learning resources for teaching primary and secondary school students to think critically about health. Implementation of a new national curriculum in Norway may present an important opportunity for introducing new learning resources. There is widespread support for increasing the emphasis on critical thinking and health. Presumably, this entails allocating more time to critical thinking and to health. However, it is unclear where the time will come from; i.e. what teachers are doing now that they can stop doing. It will be critical to engage teachers, especially (but not only) Science teachers, in designing learning resources that will be easy and practical for them to use.

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