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Designing education democratically through deliberative crowdsourcing: the case of the Finnish curriculum for basic education

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ABSTRACT

In Finland, curriculum design is allegedly carried out through a deliberative process that involves various stakeholders, interest groups, experts and ordinary citizens. To facilitate participation in curriculum design, online crowdsourcing has been applied. The objective of this study is to explore to what extent the design process of the latest Finnish national curriculum for mathematics was open, democratic and deliberative. The theoretical framework of the study is the theory of democratic will-formation of the German philosopher Jürgen Habermas. The comments given on the early version of the core curriculum of mathematics were analysed using directed content analysis, in which the above theory was applied. In the empirical analysis, the comments on the core curriculum were divided into three categories based on the quantity and quality of the arguments: strong, medium and weak modifications. Based on this empirical analysis, it is argued that majority of modifications suggested by commenters did not play a significant role in the curriculum design. Thus, in terms of the theory of democratic will-formation, there are legitimate reasons to suspect that the process was not as democratic as it was intended to be. To conclude, limits and opportunities for deliberative democracy in curriculum design are reflected upon.

KEYWORDS

Educational policy; curriculum design; crowdsourcing; discourse theory of law; Habermas

1. Introduction

The aim of this study was to explore the design process of the curriculum for basic education in Finland, which is intended to be a democratic and deliberative process. The context of the study is the design process of the Finnish National Core Curriculum for Basic Education (FNCC) and, specifically, the core curriculum of mathematics, which forms the basis for regional and local curricula further developed and implemented by municipalities and schools. In this process, educational experts, parents, as well as the general public, have the opportunity to participate online. This opportunity to comment on the curriculum online can be understood through the concept of *crowdsourcing*, which has been used especially in the field of information science.

In crowdsourcing, an organization performs a task through a collaborative and open online process. Crowdsourcing is based on the premise that there is a mutual benefit for the organization and the community from the work done, the participants are engaged in the process on a voluntary

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basis, and the organization offers an online environment where the work can be done and through which the participants can interact with the organization (Brabham, 2013, p. 3). Based on this description crowdsourcing can be described as a democratic and deliberative process that is based on open interaction between the individuals involved.

This kind of crowdsourcing approach has long been applied in the Finnish curriculum design process. It can even be said that a form of crowdsourcing has been used ever since the establishment of the school system in Finland in 1856, when the Senate of the Grand Duchy of Finland asked the public for proposals on a draft for a national school order. The authorities trusted that the Finnish pedagogical community was capable of both discussing the content and analysing the process (Halila, 1949, p. 238). To apply the concepts of the theory of democracy, it can be said that deliberative democracy, and hence crowdsourcing, germinated in the Finnish curriculum design process more than 150 years ago.

If we presuppose that a curriculum is designed democratically, there must be much in common between the theories of curriculum design and democracy. From this perspective, the curriculum design process can be understood as a form of political will-formation in the same way as the enactment of laws, acts and administrative regulations. Today, political will-formation can be executed online, which provides many possibilities (see Heng & Moor, 2003) for modern policy-making utilizing crowdsourcing and the possibilities of massive online deliberation and participatory democracy (Aitamurto & Landemore, 2016, p. 175). According to Tanja Aitamurto 'the government of Finland has crowdsourced people's ideas and comments for several legislative reforms' (Aitamurto & Chen, 2017). Crowdsourcing is also an official policy of the Parliament of Finland. As an indication of this, the Parliament of Finland published Aitamurto's (2012) book 'Crowdsourcing for Democracy: A New Era in Policy-Making'. This kind of online policymaking does not happen by itself; it needs to be consciously enabled.

From this point of view, curriculum design can be studied as a form of political action and decision making. In this article, we will explore to what extent the design process of the latest Finnish national curriculum for mathematics was open, democratic and deliberative. We focus on online participation in the FNCC design process using the Habermasian theory of democratic deliberation as an analytic tool. In the analysis, we examine the design process of the national curriculum for mathematics and analyse how individuals (e.g., educational experts, parents and teachers), as well as different stakeholders, have been involved in the process of reforming the curriculum.

The FNCC design process offers an interesting case for the following reasons. To start with, PISA (Programme for International Student Assessment) studies have presented a success story of Finnish basic education and Finnish educational policy. Secondly, according to many international comparisons, Finland falls into the top group with regard to the quality of democracy (e.g., Sustainable Government Indicators, 2019). In addition, in Nordic welfare societies, considerable power is given to professions, and the fact that the design of the Finnish national core curriculum is a mandate of the National Agency for Education instead of being a parliamentary process is a prime example of this approach. In view of the above, it is expedient for the FNCC design process to be based principally on open discourse—which, in theory, allows all parties who have an interest in the issue to participate in the process.

The aim of our research was to examine whether the FNCC design process includes the features of Habermas's open and free rational discourse, according to which all parties concerned are free to express their views and the final decisions are made in accordance with the best rational argument introduced in that discourse. Hence, our main research question is 'Was deliberative democracy actualized through crowdsourcing in the FNCC design process of mathematics in spring 2014 and, if so, how did this occur?' This main question is addressed through the following sub-questions:

(1) What modifications to mathematics were proposed in the comments on the draft curriculum for basic education?

(2) How were the comments on mathematics taken into consideration in the final curriculum for basic education?

We will first introduce the basic theoretical lines and elements of the discourse theory of law. This necessitates a short introduction to some of Habermas's previous theoretical developments. We will continue by describing the Finnish national curriculum design process, then present the data and methods of our research, and finally, based on Habermasian terminologies, analyse the latest Finnish curriculum design process.

2. Understanding the curriculum design process through the lens of Jürgen Habermas's theory of deliberative democracy

2.1. From the theory of communicative action to the discourse theory of law

Habermas's (1995) discourse theory of law has been regarded as the most highly developed theory of deliberative democracy (Englund, 2006, p. 504). To understand this theory, the idea of democratic will-formation, and how these concepts are tied to the curriculum design process and the crowd-sourcing of it addressed later in this article, we must start with the previous theoretical developments of Jürgen Habermas. Prior to his discourse theory of law, Habermas introduced ideas about democratic will-formation in his theory of communicative action (Habermas, 1984) and in his theory of discourse ethics (Habermas, 1995).

In his theory of communicative action, Habermas (1984) defined two important concepts relating to democratic will-formation: strategic action and communicative action. In strategic action, other persons are regarded as objects, whereas in communicative action, others are regarded as equal subjects of communication. More specifically, strategic action is an instrumental action towards other people—a purely goal-oriented behaviour, where other persons are not equal subjects of human interaction but rather recipients of the message. Communicative action, in contrast, is a process where two or more individuals interact, and the individuals' interests and opinions are taken into account genuinely and authentically. Further, the individuals coordinate their action based upon agreed interpretations of the situation and, more generally, the values and aims that are valued in society and thus form the background and motivation for social practices (Habermas, 1984, pp. 353–427).

Of these two actions, communicative action is prerequisite to the idea of democratic will-formation and the ideal model of free discourse. In his theory of discourse ethics, Habermas (1995, p. 88) formulated a situation that enables democratic and free rational discourse between all competent speakers. However, in his book *Between Facts and Norms*, Habermas (1996) emphasizes that in the real world, there is no such thing as purely open and free discourse, but there may be spaces that are more or less communicative. This leads to an inevitable tension between the facticity and validity of norms.

The facticity of a norm refers to what exactly a law or administrative regulation says or seeks to effect in practice. The facticity is explicitly manifested through laws, rules and regulations that have been properly enacted. In addition, there exist non-written norms, which have the status of de facto social acceptance and possess social validity (Habermas, 1996, pp. 28–31; Regh, 1996, p. xvi). A norm is factual if it has coercive power: a person who breaks the rule can be punished or at least criticized. For instance, if a teacher does not follow the curriculum, he or she can be penalized or, at least, some administrative measures will follow (Huttunen & Heikkinen, 1998).

The validity of a norm is established in an ideal discourse between all potential participants. Validity means how justified, just or accepted the norm achieved in the discourse is (Habermas, 1996). According to Thomas Englund (2006, p. 504), a good argument creates validity and is essential for social integration. Habermas (1996) connects the validity of a norm to discourse principle D, which he defines as follows: 'Just those action norms are valid to which all possibly affected persons

could agree as participants in rational discourses' (Habermas, 1996, p. 107). With the phrase 'action norms', Habermas (1996) refers to 'temporally, socially, and substantively generalised behavioural expectations' (Habermas, 1996, p. 107).

For rational discourse, which is essential for the validity of a norm, Habermas (1984) sets strict procedural preconditions. A norm is valid if it is an outcome of a free, open and critical discourse. The discourse should be the kind in which all affected persons are able to participate in the discussion, all affected parties are heard, and nobody in the discussion has hidden agendas. In addition, one important condition in rational discourse is that three so-called validity claims are used in the proper manner. Habermas claims that the world, or our view of it, is divided into the objective world, the social world and the subjective world, and a communicatively competent speaker can evaluate any statement about the world according to any of these three validity claims: truth, rightness and truthfulness. When the statement concerns natural phenomena or other aspects of the objective world, then the proper validity claim is truth (ger. *Wahrheit*). When the statement concerns the social world, the proper validity claim is rightness (ger. *Richtigkeit*). And when the statement concerns the subjective world, the proper validity claim is truthfulness (ger. *Wahrhaftigkeit*). For example, to claim that the curriculum is unjust based on 'gut feeling' is an improper validity claim. The proper validity claim in that case is generally accepted rightness, not one's truthful inner feeling (Habermas, 1995, p. 58.)

Ideally, all factual norms would be valid; that is to say, everything that the norms factually state would be based on free and public discussion. However, in real life, there is always tension between the facticity and validity of a norm. This is because a factual (facticity; ger. *Faktizität*) norm never quite fully reflects the moral and ethical grounds (validity; ger. *Geltung*) of the norm, which are ideally achieved through unforced consensus. In addition, norms can lose their acceptability over time, increasing the tension between facticity and validity. Thomas Englund (2006, p. 206) emphasizes that the Habermasian idea of deliberative democracy implies that the outcome of a discourse is always temporary. Thus, new discourses are needed from time to time to achieve a more up-to-date consensus on the norm. The tension between facticity and validity is illustrated in Figure 1.

The tension between facticity and validity can be diminished, but never abolished. To diminish the tension between facticity and validity, the process of creating an action norm should be as open, critical, reflective, democratic, considered and empowering as possible. Habermas calls this process democratic will-formation. Nowadays, this process can be carried out through online crowdsourcing. According to Boman's (2006, p. 551) interpretation of Habermas's assertion, only 'a vibrant public sphere' can guarantee the democratic validity of a political decision-making process. A crowdsourced curriculum design process could be just such a vibrant public sphere.

2.2. The curriculum design process as deliberative will-formation

In the light of the theory of discourse ethics, we examine whether the Finnish national core curriculum (FNCC) design process includes the features of Habermas's open and free rational discourse according to which all parties concerned are free to express their views and the final decisions are made in accordance with the best rational argument introduced in that discourse. In accordance with the theory of communicative action, the FNCC design process can be understood through the concepts of communicative action and strategic action, which form the basis for the lifeworld dimension and the system dimension of social life.

In order to answer the questions of this study, we had to examine both curriculum design as a type of legislation process and the outcome of that process, i.e., the national core curriculum. Like laws, a curriculum is, on the one hand, a binding norm that needs to be followed, but on the other hand, it is continually contested and subject to discussion. This contestation between the actual norms (facticity) and the moral and ethical grounds of the norms (validity), as conceptualized in Habermas's discourse theory of law, manifests in the discussions about the content and aims of the curriculum.

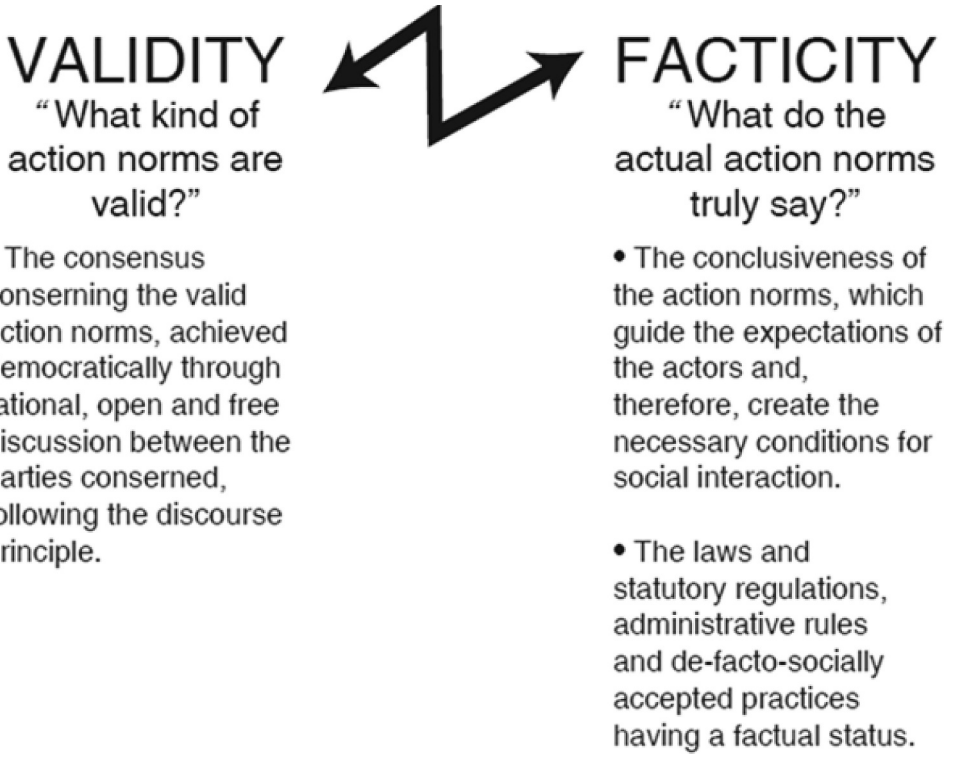

Figure 1. The tension between the facticity and validity of an action norm (Habermas, 1996, pp. 90–91; Huttunen & Heikkinen, 1998; Regh, 1996, pp. xvi–xvii).

The aspect of democratic will-formation must be considered when the curriculum process as a whole is evaluated. As introduced above, a norm—in this case, the curriculum—as an outcome of collective will-formation can never be perfectly valid in the Habermasian sense. That is, no new curriculum can totally abolish the tension between facticity and validity. Thus, the tension itself is not a sign of failure in the curriculum design process. The tension between facticity and validity is a kind of dynamic engine, which forces the continuation of discussions on the rightness of the curriculum. The national curriculum in Finland has been repeatedly renewed as a result of ongoing discussions regarding its validity. Typically, the new curriculum is enacted before the tension between facticity and validity becomes too large (Heikkinen et al., 2014).

Habermasian conditions for a democratic process are rather demanding. All official norms, including the national core curriculum, should be based on democratic discourse. The discourse should be free, open and critical; all possible affected persons should be able to participate, and there should be no hidden agendas in the discussions. To create a democratic discussion around the curriculum, active efforts should be made by public officials to ensure that different parties are able to participate. In Finland, this means that the Finnish National Agency for Education is responsible for not only laying the norm, but also facilitating the discourse and making sure that the process is done democratically. The agency should also ensure that as many relevant parties as possible are able to take part in the design process. This dual role as both norm-setting institution and facilitator of public discourse means, in practice, that the agency has to find a role between preparing the norm, making choices and creating open spaces for communication. This dual role is also commonly adopted by other stakeholders responsible for educational policy decisions in Finland. The nature of the curriculum process has been described in the following way by two counsellors of education

working in the National Agency for Education who are both educational scientists. They emphasize the participatory and deliberative nature of the curriculum design studied in our article:

> The national core curriculum was designed in extensive co-operation with the organisers of teaching, schools, teacher education departments and research and other significant stakeholders. … Efforts were made to keep the design of the national core curriculum as open as possible not only to organisers of education and schools, but to all the citizens. (Vitikka & Rissanen, 2019, 231)

3. Context

Curriculum reform in Finland may be described as a cautious and slow process of alteration, rather than an ambitious pedagogical revolution. The latest renewal of the curriculum at the primary and secondary levels, as well as at the pre-primary level, took place between 2012 and 2016. The reform was not so much triggered by topical concerns about education, but rather followed from the regular cycle of national curriculum design. Prior to the latest reform, the national curriculum has been reformed five times in the last 50 years (1970, 1985, 1994 and 2004).

In the context of national curriculum design in Finland, one might question the value of reforming a system that works well. The answer is the aforementioned tension between facticity and validity, which inevitably increases over time. We are witnessing a rapid change in the global context of education. Whereas decades ago the main concern in Finland was to build a national identity through education, the challenges today are much more global—such as global warming, overuse of natural resources, and environmental pollution. The growing concern for enabling a sustainable future for the next generations shifts the focus towards different skills and capacities compared to the past. Consequently, the content of teaching, pedagogy and school practices should be renewed in relation to changes in the operational environment (Halinen, 2015).

The curriculum design process in Finland starts as a legislative process at a high formal level. The process is launched by the Parliament of Finland, which stipulates education acts and decrees. The Government Decree on the National Objectives for Education Referred to in the Basic Education Act and in the Distribution of Lesson Hours was passed in 2012. It describes the divisions between school subjects and the time allocated to these. This work is based on a preparatory work of the Ministry of Education and Culture, which does most of the strategic planning.

The Finnish National Agency for Education, operating under the Ministry of Education and Culture, has an important role in coordinating the Finnish National Core Curriculum (FNCC) process. According to the Basic Education Act, the Finnish National Agency for Education

> shall determine the objectives and core contents of different subjects and cross curricular themes, guidance counselling and other education referred to in this Act and the basic principles of home-school cooperation and pupil welfare under the purview of the local education authority (core curriculum). (Basic Education Act 628/1998, §14)

This means that the design of the national core curriculum is not a parliamentary process and, consequently, representative democracy and party politics do not have a role in the curriculum design. The National Agency of Education has a full mandate to govern the process, while the FNCC provides the basis for local curricula in municipalities and schools. The education providers—that is, the municipality authorities and the schools—draw up their own curricula within the framework of the national core curriculum, emphasizing locally significant and profile-related content and regional points of emphasis (Erss et al., 2016). The legislative process is described in Figure 2.

The FNCC design process started officially when the government of Finland prepared a government decree on the 28th of June 2012. After this, the Finnish National Agency for Education had a mandate to work on the FNCC. As in the previous design processes, teachers, teacher educators, parents, educational researchers and other citizens and nongovernmental organizations were involved in the public discussions on the aims, methods and values manifested in the national core curriculum. In the local curriculum design process, which was conducted in every

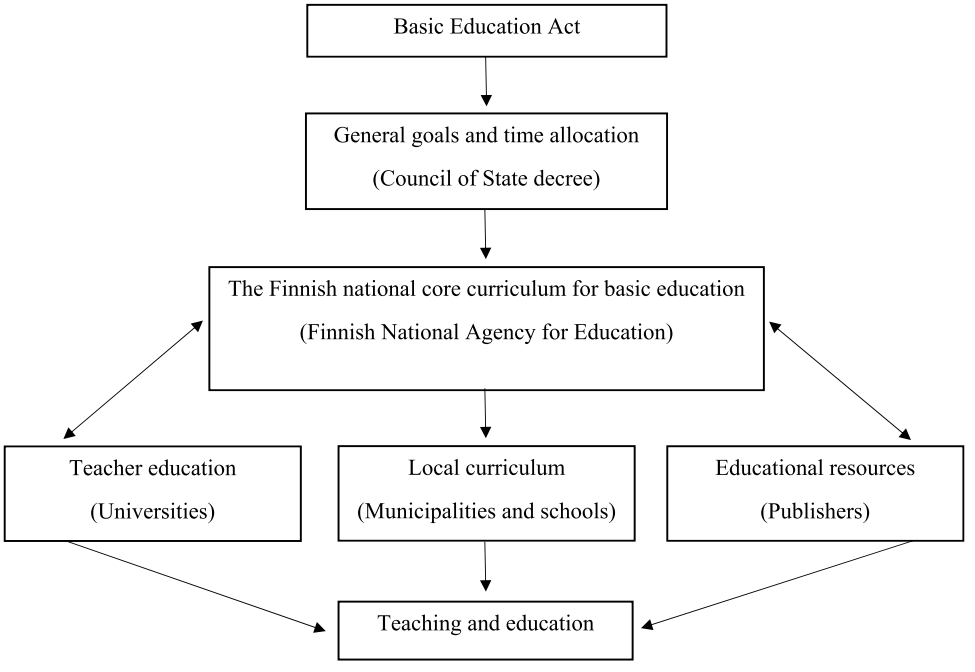

Figure 2. The steering system of Finnish basic education (Vitikka, 2009, p. 68).

Finnish municipality, local community members were also involved. Inclusive and democratic intentions were emphasized in the official information provided by the Finnish National Agency for Education (2015): 'The preparation of the curriculum is interactive. All education providers can follow the preparation and give feedback at the different phases. They are also encouraged to involve pupils and their parents in the process'. The latest national curriculum design process consisted of three rounds, during which all interested parties had the opportunity to give online feedback on the FNCC drafts. The first round of curriculum design was in autumn 2012, the second in autumn 2013 and the third in spring 2014. Two of these rounds, autumn 2012 and spring 2014, concerned the curriculum for basic education. The final FNCC was officially given on 22 December 2014. The process lasted for two and a half years. The timeline and the most important phases of the process are described in Table 1.

4. Data and methods

As the focus of our study is on the democratic nature of the curriculum design process, we narrowed the data to documents pertaining as closely as possible to this. The data consist of three documents connected to the Finnish National Core Curriculum (FNCC) design process during 2014:

(1) The draft of the FNCC and the part concerning mathematics for grades 1–9 published in April 2014
(2) Online comments submitted in April and May 2014 on the above-mentioned draft
(3) The mathematics section of the final FNCC published in December 2014

In 2016, access to the documents was not straightforward. The draft of the FNCC and the comments submitted on it were available only from the archives of the Finnish National Agency for Education. At that time, the final version of the FNCC was accessible both as a print and online

Table 1. Timeline of the curriculum design process.

Time	Stages of the process
Autumn 2012	• Preparation of the general framework of the national curriculum • The groups responsible for preparing the curriculum nominated • First round of comments on the national curriculum (19.11.2012–5.12.2012): in total, 1,120 comments on the web query and 114 answers on basic education by the local organisers
Spring 2013	• Seminars to support the local curriculum design • Work on the general part of the curriculum
Autumn 2013	• Second round of comments (9.9.2013–27.9.2013) the preschool curriculum) • The National Board of Education started organising seminars for teachers
Spring 2014	• Third round of comments. (15.4.2014–15.5.2014 basic and additional education) • Hearings of the invited stakeholders of the preschool curriculum • Local seminars
Autumn 2014	• Hearings of the invited stakeholders of the final version • National core curriculum accepted in 2014
Spring 2015–August 2016	• Preparation of local curricula

version. The aim was to focus on a subject that had an established position and history in the FNCC and had inspired people to comment on the draft. Finnish language and literature and mathematics both fulfilled these conditions. Due to the introduction of an entirely new content area (programming) and the various comments inspired by it, mathematics was selected as a focus area for this study.

The FNCC and its draft versions include the objectives and core contents of different subjects, the principles of pupil assessment, special-needs education, pupil welfare, and educational guidance. It also includes principles of a good learning environment, as well as teaching and learning methods and the distribution of lesson hours. The drafts of the FNCC, as well as the final version, are divided into three grade groups: grades 1–2 (ages 7–8), grades 3–6 (ages 9–12) and grades 7–9 (ages 13–15). The contents are presented in either text or table format. The tables allude to different content areas of the subject, such as how to support the pupil in expanding his or her understanding of the decimal system concept. In addition, there are also allusions to transversal competences, such as working life competence and entrepreneurship.

The Finnish National Agency for Education established a discussion forum on the Curriculum2016 website during the latest FNCC design process. All stakeholders and interested parties were free to give feedback and influence the curriculum process on the website (Halinen, 2014). The online forum was open for comments for a month in autumn 2012, autumn 2013 and spring 2014. In spring 2014, 126 heterogeneous comments were submitted on mathematics. Some comments regarded certain grades, while others were more general. The length of the comments varied from a few words to tens of sentences. The comments included both positive and negative comments. There were also some concrete suggestions for developing the curriculum.

The research questions and the analysis of the documents were strongly steered by Habermas's theory of discourse ethics and the idea of open and free rational discourse. However, the online forum did not enable such discourse as described in the theory of discourse ethics. The forum lacked the possibility to express views and deliberatively discuss one topic at a time; therefore, pure deliberation could not form the basis of this study. As Habermas (1996) himself emphasized, in the real world, a purely open and free discourse does not exist. Our data, which we examined through Habermas's theory, were no exception.

By using directed content analysis (i.e. the analysis at this point was theory-driven, following deductive reasoning), it was possible to conceptually extend this theoretical framework and use it to guide the discussion of the findings (Hsieh & Shannon, 2005). In addition to directed content analysis, our research has features from document analysis. For instance, Bowen (2009, p. 30) mentions that the drafts of a document can be used to track change and development, which was done in this research by studying the two curriculum versions and the virtual comments. We analysed the two

versions and the comments during the analysis in order to answer the research questions. In total, there were three phases in the analysis: gathering the suggested modifications from the comments, identifying the differences between the draft curriculum and the final curriculum and, finally, finding connections between the suggested modifications and the final curriculum. At this point, the analysis followed inductive reasoning, and all of the categories were derived from the data.

The first phase focused exclusively on the 126 comments submitted on mathematics. The analysis proceeded from specific to general. First, we divided the comments into smaller sections based on the topics discussed. We then tied each topic to grades 1–2, 3–6, 7–9, 1–6, 3–9 or 1–9 depending on the grades that the comments concerned. After gathering together all of the comments given on each topic, the ratio between positive comments, such as 'It's great that the importance of programming skills has been brought up', and negative comments, such as 'It's good that understanding IT is given a greater role, but programming should not be taught as a part of mathematics' determined whether or not we labelled the topic as a topic of modification. If there were more negative comments than positive ones, the topic was considered a topic of modification. We then classified the topics of modification as strong, medium or weak based on the number of comments given on the topic. In keeping with the idea of deliberation, in which the argument itself is considered important, the argumentation in the comments was also taken into account as a factor in deciding whether the topic of modification was strong, medium or weak. Thus, argumentation (validity claims) made in a proper manner strengthened the class of the topic. For example, the topic of mathematical economics gained only three comments in total, but thorough argumentation in the comments upgraded the topic from weak to medium. After we tied the topics to grades and a strength category, we assembled the suggested modifications for each topic from the comments. For example, a strong topic of modification was 'programming', and one suggested modification regarding that topic was that 'programming should be removed from the curriculum'.

The second phase included the draft curriculum and the final curriculum. We compared the two curriculum versions and recorded the differences between them. Numerous differences between the curricula were identified, ranging from major to minor. Minor differences that did not significantly alter the content of the curriculum, such as minor changes in wording from singular to plural (e.g., 'student' to 'students'), were classed as negligible and not included in the data.

In the third phase, we combined the results of the first and second phases. First, we studied the similarities between the suggested modifications from the first phase and the final curriculum. We named these similarities 'noted suggested modifications'. Suggested modifications that were not part of the final curriculum were labelled 'unnoted suggested modifications'. All other changes between the curricula were 'changes based on factors other than suggested modifications'.

5. Results

5.1. The suggested modifications

In total, we identified 20 suggestions based on the online comments. Following the principles of Habermas's theory of discourse ethics, we divided these into strength categories according to the number and quality of the comments given per suggestion. Six of the suggestions were strong (Table 2), six were medium (Table 3) and eight were weak (Table 4). Each table contains three columns: the grades that the suggestion concerns, the modification topic, and the suggested modifications for that topic. The topics in the tables are ordered by grade.

5.2. Noted suggested modifications

By comparing the draft curriculum and the final curriculum, we identified a few changes that could be traced back to the comments. These changes concerned three topics: programming (strong), opposite numbers and absolute value (medium), and cooperative learning (medium). Of these three

Table 2. Strong suggested modifications for the curriculum.

Grades	Topic of modification	Suggested modifications
1–9	Programming	**a)** Programming should be removed from the curriculum **or** **b)** the content, concepts and tools for programming should be specified.
1–9	The amount of content topics in mathematics	There should be fewer content topics in mathematics.
1–9	Internet and communication technology (ICT) as part of mathematics	**a)** The role of ICT should be smaller **and** **b)** ICT should be mentioned merely as an instrument for studying.
1–9	The form of the draft	**a)** The tables should be more readable, **b)** the meaning of the abbreviations should be found where they are needed **and** **c)** the contents of the subject should be presented as a list instead of text.
1–9	The content topics for each grade	The content topics should be defined and listed for each grade, from 1 to 9, instead of the three grade groups (1–2, 3–6 and 7 9).
7–9	Thales's theorem	**a)** The mention of Thales's theorem should be removed from the curriculum **or** **b)** other mathematical concepts should be mentioned as specifically as Thales's theorem.

Table 3. Medium suggested modifications for the curriculum.

Grades	Topic of modification	Suggested modifications
1–6	Multiplication tables	**a)** The learning of multiplication tables should not commence earlier than in the third grade **or** **b)** only the multiplication tables 1, 2, 5 and 10 should be learned in the grades 1–2; the rest of the tables should be learned later.
3–6	Division algorithm	**a)** There should be an introduction to the other ways of executing division **or** **b)** the division algorithm should be reintegrated into the curriculum as such.
3–9	Opposite number and absolute value	The concepts of opposite number and absolute value should be transferred from the contents of grades 3–6 to the contents of grades 7–9.
7–9	The criteria for a passed final mark in the ninth grade	The criteria for an adequate mark (5) should be presented in the evaluation chapter of the ninth grade.
7–9	Cooperative learning	**a)** The concept of cooperative learning should be expressed otherwise (e.g., as working in pairs or groups) **and** **b)** this approach should be in a lesser role in the curriculum.
7–9	Mathematical economics	There should be a greater emphasis on mathematical economics.

Table 4. Weak suggested modifications for the curriculum.

Grades	Topic of modification	Suggested modifications
1–2	Number sequence skills	**a)** The emphasis on number sequence skills should be greater **and** **b)** the content of it should be more specific.
1–2	Talking mathematics	There should be a greater emphasis on mathematical talking—for instance, explaining your solution to a mathematical problem aloud rather than only writing it on paper.
1–2	Problem-solving skills	There should be a greater emphasis on problem-solving skills. Especially, problem solving in everyday life should be emphasized.
1–6	The concept of time	The concept of time should be a part of the curriculum through grades 1–6, not only through grades 1–2.
1–6	The algorithms for addition and subtraction	The algorithms for addition and subtraction should be taught in grades 1–2.
1–9	Learning environments outside the classroom	There should be a mention of learning environments outside school.
3–6	The criteria for a good mark (8) in the sixth grade	The criteria for a good mark (8) should be eased.
7–9	The criteria for a good final mark (8) in the ninth grade	The criteria between different marks should be more distinct.

topics, programming was especially commented on, and many of these comments included argumentations (validity claims) that were properly made. Despite programming being one of the most strongly suggested topics of modification and proper argumentations for it were made, the changes

actually made regarding this topic were minor. The comments concerning programming suggested either totally removing programming from the mathematics content or further specification of the contents, concepts and tools used. However, in the final curriculum, programming was still a part of mathematics and no significant further specifications were added regarding its concepts or tools. The content of programming was, however, further specified to some extent. For instance, for grades 1–2 'creating directions for action' was specified as 'creating phased directions for action'. Also, for grades 3–6 'practicing programming' was broadened to 'designing and executing programming'. Although these changes enable better comprehension of the content of programming, the majority of the suggested modifications within the topic of programming were not executed.

The only suggested modification that was executed was the medium strength suggestion regarding opposite numbers and absolute value. As suggested in the comments, both of these concepts were transferred from grades 3–6 to grades 7–9. However, the medium strength suggested modification regarding expressing cooperative learning in other words and diminishing the role of this approach was, as with programming, only partly executed. The concept of cooperative learning was expressed in other words, but the role of cooperative learning remained significant as there were still several mentions of 'working together' or 'acting together' in the curriculum. These three partly or entirely executed suggestions are presented in Table 5.

5.3. Unnoted suggested modifications

The majority of suggested modifications did not make it into the final curriculum. Strongly suggested topics of modification that had no direct impact on the final version included Thales's theorem, the content topics in mathematics, ICT as a part of mathematics, the form of the draft curriculum, and the definition of content topics for each grade. In addition to the topic of programming, Thales's theorem was commented on multiple times and argued with proper validity claims. As with programming, the majority of suggested modifications regarding Thales's theorem were disregarded. The mention of Thales's theorem remained unaltered, and no other mathematical concepts were mentioned precisely by name.

Furthermore, the modification suggestion to reduce the number of content topics in mathematics was not executed; the only evident change regarding this topic was that some content topics were reallocated between grades. Thus, although the grade allocation of certain content topics was modified, the total number of content topics remained unchanged. The topic of ICT as a part of mathematics was also modified, but not in the way suggested in the comments. The suggested modifications for this topic were that the role of ICT should be reduced, and that ICT should be stated as being merely an instrument for studying. However, the importance of ICT—the number of statements and themes dedicated to ICT—remained

Table 5. The suggested modifications which were executed in the curriculum process.

Grades	Topic of modification	Suggested modifications	Executed modifications
1–9	Programming	**a)** Programming should be removed from the curriculum **or** **b)** The content, concepts and tools for programming should be specified.	**b)** The content was slightly specified.
3–9	Opposite number and absolute value	The concepts of opposite number and absolute value should be transferred from the contents of grades 3–6 to the contents of grades 7–9.	The concepts of opposite number and absolute value were transferred from the contents of grades 3–6 to the contents of grades 7–9.
7–9	Cooperative learning	**a)** The concept of cooperative learning should be expressed in other words (e.g., as working in pairs or groups) **and** **b)** This approach should be in a lesser role in the curriculum.	**a)** The concept of cooperative learning was expressed in other words.

unchanged, although the placement of the statements and themes was changed within the mathematics section. Merely relocating certain statements and themes regarding ICT fell short of executing the suggested modifications. Some modifications were made regarding the form of the draft curriculum, but these did not reflect the modifications that were proposed. The suggested modification was to make the tables in the curriculum more readable—explaining abbreviations where needed and presenting the contents of mathematics as a list instead of in text form. These proposed changes remained unchanged, although in some parts of the curriculum the text was condensed and sentences were modified. Supposedly, these changes were made in order to make the curriculum more readable, but the changes did not significantly diminish the problems identified by the commenters. Thus, the suggested modification of making the curriculum more readable was not executed. The suggestion of defining the topics taught for each grade was not executed either, and no other changes were made with respect to this suggested modification.

The medium topics of modification that were not executed were the division algorithm, mathematical economics, multiplication tables, and the criteria for a passed final mark in the ninth grade. The criteria for a passed final mark in the ninth grade was the only topic that was modified, although the suggested modification of adding the criteria for an adequate mark (5) (hereafter AM5) in the ninth grade was not added to the final curriculum. Instead of adding the criteria for AM5, parts of the chapter regarding the evaluation criteria for the ninth grade were removed entirely. The draft curriculum included three different descriptions of competence in the assessment chapter: the criteria for competence below a good mark (8) (hereafter GM8), the criteria for GM8, and the criteria for competence over GM8. The commenters expressed their considerable approval of these three competence criteria descriptions. In addition to these three criteria, they wished for a description of the criteria for AM5. However, the final curriculum included only the criteria for GM8. Thus, instead of adding the criteria for AM5 as suggested, the criteria for both below and over GM8 were removed entirely. Thus, the weak proposition of making the criteria for different marks more distinct in the final assessment was not conducted either. None of the weak topics of modification were executed in the final version, and there were no significant changes made within these areas. To conclude, while some changes related to the suggested modifications were made, the suggested modifications themselves were largely disregarded.

5.4. Changes based on factors other than suggested modifications

Strong suggestions should have been most likely to be executed, followed by medium and weak suggestions. However, in reality, only 3 of the 20 suggestions were executed, and these were not even the three strongest suggestions. Of the six strong topics of modification, only programming was partly executed, and of the six medium topics of modification only two, opposite numbers and absolute value and cooperative learning, were executed either partly or as such. While only the above three suggested modifications were taken more or less into account, more than three changes between the curriculum versions were identified in total.

In all parts of the mathematics curriculum—the task of the subject, objectives of instruction, key content areas related to objectives, learning environments, working methods, ways of support and evaluation—there were changes that could not be traced back to the suggested modifications. Contents had been simplified, specified, relocated, removed and added. In Table 6, a few examples of these measures are presented.

Many of the changes made were not mentioned in any of the comments, but a few of them were mentioned once or twice. For instance, the inverse principle (i.e. that addition and subtraction and multiplication and division are inverse operations of each other) was removed from the content of grades 3–6 in the final curriculum, even though it was mentioned in only two comments that the inverse principle should be defined more specifically or removed from grades 3–6. However, the comments regarding the inverse principle did not include any significant arguments to support this

Table 6. Examples of simplified, specified, relocated, removed and added contents between the draft and the final curriculum.

Simplified	• 'To build a foundation for numeracy, the students have to identify and know how to use the decompositions of numbers 2–10' was simplified to 'familiarizing with the decompositions of numbers 1–10'. • The description of evaluation was changed from being 'encouraging and truthful' to 'diverse'.
Specified	• The concept of 'root' was specified to 'square root'. • 'The differences in students' skills' was specified to 'the differences between students should be studied immediately when the first grade begins'.
Relocated	• The concepts of power and variable were transferred from the contents of grades 3–6 to grades 7–9. • The mention of 'pedagogical games' as part of mathematics in grades 1–2 was transferred to another section of the curriculum; from 'the ways of support' to 'learning environments'.
Removed	• For grades 3–6, the mention of 'using compasses and ruler in drawing' was removed. • The mention of 'two-way feedback' between students and teachers was removed.
Added	• In grades 7–9, mentions of 'pondering and defining counts' and 'mastering the transforming of measurement units' were added to the contents. • The mention of 'using variable learning methods and students' possibility to affect these methods' was added to grades 3–6.

change; therefore, in this study, the topic was not classified even as a weak topic of modification. The same phenomenon can be seen in regard to the suggestions for specifying 'root' as 'square root' and 'inequation' as 'linear inequation' in the text, as these changes were made even though they were mentioned only once or twice in the comments. Thus, it seems that topics that inspired several comments and were wellargued had just as much influence in the curriculum process as topics that were mentioned only once or twice. In other words, the final action norms were in some cases decided by a single comment instead of the result of a rational discourse in which several different people expressed their views. This contravenes the Habermasian concept of valid action norms (Habermas, 1996), as not all of the affected persons have agreed on the norms through rational discourse.

To conclude, the results of our study show that most of the changes made between the curricula were based on something other than the comments given on the draft curriculum in spring 2014. There may be various reasons for these inconsistencies. One possibility is that the comments were not included in the curriculum design process at all and that any association between the comments and the changes made are merely coincidental. Another possibility is that the comments served as a pool of ideas from which some were simply picked and executed at random. A third option is that the comments were analysed and noted, but decisions were made not to take action based on them. In none of these scenarios did the number of comments or the reasoning behind them matter, and all of the changes made were based on other factors. For instance, the hearings of the invited stakeholders regarding the final version might have led to the changes made to the curriculum, or the members of the Finnish National Agency for Education may have made the changes based on their own judgement. However, these kinds of procedures taken by the authorities do not diminish the tension between facticity and validity. To reduce this tension, validity needs to be based on open and free public discussion, and the factual norms should be, at least to some extent, derived from this public discourse. Based on the results of our study, we argue that this was not the case during the FNCC design process of 2016. However, we wish to point out that even though our results indicate that the comments did not have a significant role in designing the final curriculum, the comments might have affected other papers connected to the curriculum. In this study, these papers were not part of the data, and documents such as stimulus and support materials were not studied. The stimulus and support materials are additional documents of the curriculum that provide further guidelines on how to implement certain school subjects, such as physical education and crafts.

6. Discussion

Was the Finnish National Core Curriculum (FNCC) design process truly democratic? In this study, we defined democracy as a deliberative and dialogical process of rational collective will-formation in which all parties may participate and make reasoned suggestions. In the process of curriculum design, this

would mean that (1) those elements of the draft curriculum that have received most critical comments would be focused on, (2) the arguments supporting these critical comments would be carefully considered and (3) changes to the curriculum would be made regarding the points most commented on if the reasoning behind the comments were rational and based on proven pedagogical evidence. Our empirical analysis shows that (1) the sections of the curriculum that received the most critical comments were not necessarily focused on, (2) rational and research-based argumentation did not appear to be fully respected and (3) well-argued suggestions did not always lead to changes despite the carefully formulated arguments; however, other sections of the curriculum were changed, although they were not addressed by the commentators.

In our analysis, we found many well-reasoned ideas presented in the comments. However, only a fraction of these ideas was carried out in the design of the final curriculum. Some changes were made even in exact opposition to the suggested modifications. Not even strong and well-argued suggestions for modifications appear to have led to changes, and it remains unclear who actually made the final decisive choices. Providing an online discussion phase in the curriculum process supported the idea of crowdsourcing, but in the end, the outcomes of crowdsourcing did not lead to major changes. It appears that the experts of the Finnish National Agency for Education still dominate the FNCC design process, even though it was they who originally presented the idea of a democratic curriculum process. Our observations may be a cause for concern; we consider that the idea of a democratic and truly crowdsourced curriculum design process did not succeed as intended. As a result, there is considerable tension between the facticity and the validity of the curriculum of mathematics regarding the application of the concepts of Habermas' discourse theory of law.

This study raises some concerns about the transparency and democracy of the FNCC design process. Our analysis shows that the Finnish National Agency for Education, which has a legal mandate to design the curriculum, seems to act in multiple roles in the process. Since the design of the national core curriculum is not a parliamentary process, analysing these roles explains how the national core curriculum was governed. The agency is simultaneously a facilitator of discussions, an agent responsible for soliciting interest discussions, a body of authority responsible for formulating an official norm and even, to some extent, a law enforcement body. In other words, there seems to be a risk that the three different political powers—the legislature, executive, and judiciary—are blurred in the FNCC design process. In Western democracies, the separation of powers doctrine has been one of the cornerstones providing essential elements of Western jurisdiction.

It is apparent that the separation of powers doctrine is somewhat muddied in the FNCC design process. This poses a risk to democracy: it is alarming if norm makers themselves take on the role of guardians of norms. Furthermore, there seems to be a wholesale lack of concern or awareness among the norm makers regarding this danger. We believe that this demands much closer attention in the future. This would also be an appropriate topic for further research: Are there blind spots in the Finnish curriculum reform system that endanger democracy and transparency?

Finland has been known for renewing its education gradually and moderately, and its pedagogical practices have been regarded as rather conservative (Simola, 2005, p. 461). Finns seem to have previously held to the view, as Pasi Sahlberg (2019) crystallized, that: 'Reforming schools is a complex, slow process. To rush it is to ruin it'. However, lately, politicians have been criticized for speeding up educational reforms and making them less transparent (Tervasmäki & Tomperi, 2018), even to the extent that they have started to resemble a textbook example of 'fast policy' (Hardy et al., 2020; Peck & Theodore, 2015). Whether the government will continue to implement a fast policy doctrine remains to be seen and is a subject for further study. Critical research is also needed in a country that is considered one of the best democracies in the world with, allegedly, one of the best educational systems.

Regarding the reliability of the study, the accuracy of the analysis has been ensured by having the empirical part verified by one of the authors who is the thesis supervisor of the researcher who conducted the analysis. The credibility of the research is also enhanced by the fact that two of the members of the research group have been involved in national core curriculum design via workshops and seminars and through commenting on the core curriculum drafts online, and thus have

good background knowledge of these processes. They also have experience as independent external experts through participating in the discussion and reflecting on the part of the curriculum concerning general educational goals. However, they have not been involved in the development of the mathematics curriculum. They, therefore, have no personal commitment to the matter, despite their familiarity with the curriculum design process at a general level.

Disclosure statement

The authors declare no conflict of interest.

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