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THE FINNISH MATHEMATICS TEACHERS' LEXICON

A focus on organisation and relationships

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Introduction

Teachers' professional language reflects their pedagogical thinking. The richer and more nuanced teachers' professional language is, the more possibility there is for elaborate reflections and discussions about teaching and learning (Mesiti et al., 2016). In this chapter, we examine the pedagogical language of Finnish mathematics teachers. An overview of the Finnish education system is provided first to provide a context for this examination.

Classroom culture in Finland appears to be based on two strong and conflicting, but also interweaving discourses: a tradition of formal and social pedagogy, and a top-down implemented individualist didactic of the basic school (Simola, 1998). Schooling in Finland has historically been compulsory, with the aim of educating the masses as future citizens. Finnish teacher training was dominated by a strong Herbart-Zillerian tradition until the late 1940s. Pedagogical individualism entered into Finnish educational discourse later, as a top-down education reform designed to complete a social education mission. The principle of individualised teaching was not part of the Finnish pedagogical vocabulary until the 1960s.

Interestingly, there is limited research about what happens in Finnish classrooms. From the 1980s, empirical research based on videotaped lessons concluded that the model of verbal interaction in classrooms seems to have remained the same for a long period of time; the teacher talks more than two thirds of the time and the pupils give short responses (Leiwo, Kuusinen & Kuusisto, 1981; Leiwo, Kuusinen, Nykänen & Pöyhönen, 1987). One characterisation of the Finnish comprehensive school classroom might be considered crushing: A "wasteland not only of intelligence but also of emotions" (Leiwo et a1, 1987, p. 169).

Nearly a decade later, a British evaluation team reported on their observations of Finnish classrooms. The team visited, observed and interviewed principals, teachers and students in 50 schools that were selected because they were pilot schools or otherwise interested in curriculum reform. They concluded that "in both the lower and upper comprehensive schools, we did not see much evidence of, for example,

student-centered learning or independent learning" (Norris, Asplund, MacDonald, Schostak, & Zamorski, 1996, p. 29).

A few studies on Finnish teachers from the 2000s have presented a clear picture of a profession that is committed to its traditional work in the classroom, and resistant to and strongly critical of innovations. According to a survey, eight out of ten Finnish teachers see their work as rewarding, like it, and are strongly involved in it (Santavirta, Aittola, Niskanen, Pasanen, Tuominen, & Solovieva, 2001; see also Virta & Kurikka, 2001). What appears to stress them the most are the required meetings, planning and reporting, not the basic classroom work. Syrjäläinen (2002) interviewed teachers about their experiences of and attitudes toward recent school reforms and innovations. She summarised their critical thinking as follows: reforms mean too heavy a work load; teachers have no say in the innovations; the development work is too often chaotic; the sphere of teachers' responsibilities has been extended too far; only lip service is paid to professional responsibility and competence; and, there is too much unrealistic and even dangerous development work (Syrjäläinen, 2002, pp. 90–100).

Traditional teaching appears to be prevalent in Finland. According to the comparative TALIS 2013 study (Taajamo, Puhakka, & Välijärvi, 2014), compared to teachers in the other 34 participating countries, Finnish lower secondary teachers: give fewer different tasks to different students (37% and 44%, respectively); prefer less group work (34% and 47%, respectively); refer less often to everyday problems in teaching (64% and 68%, respectively) and give less literal feedback to students (25% and 54%, respectively). In the most recent TALIS 2018 (OECD, 2019), Finnish teachers show little change between 2013 and 2018 in many of the studied domains, such as in the use of teaching practices pertaining to clarity of instruction (OECD, 2019, p. 57) and in working hours (OECD, 2019, p. 71). Finnish teachers also continue to report a strong sense of their profession being appreciated in society.

Simola and her colleagues (Simola, Kauko, Varjo, Kalalahti & Sahlström, 2017) state that the dynamics of Finnish classroom cultures seems to combine two discourses: a strong Finnish paternalistic pedagogical tradition and pupil-centred progressivism. The progressivism has mainly been a top-down process emanating from the national curriculum and teacher education for comprehensive school, whereas the paternal pedagogy is at the core of a traditional approach to schooling. This classroom pedagogy is paternalistic in the sense that teachers see themselves as adults keeping a professional distance from pupils and parents; it is progressive in its heavy commitment to the "'no child left behind"' ideology that is strongly supported in state educational discourse, efficient special-education and remedial teaching systems, school healthcare and other welfare services and free school meals for all pupils (Simola et al, 2017, p. 111).

In PISA studies (e.g. OECD, 2013), Finnish students have been above the OECD average in their performance, with a gender difference clearly in favor of girls. The Finnish education system has small between-school differences, but quite large within-school differences. Students appear to have relatively low anxiety and low enjoyment, and report a realistic self-concept. Correlation between perseverance and mathematics performance is strong.

The formal qualification for a mathematics teacher in Finland is a Master level degree that includes specific credits of mathematics and specific credits of pedagogical studies. Some experienced teachers have a previously recognised Bachelor level degree. A national evaluation found that almost all teachers are formally qualified and that most of them teach two or more subjects (Hannula & Oksanen, 2013). The typical teaching subject combinations reported were mathematics and physics, and/or chemistry. Gender balance for mathematics teachers was fairly equal (43% male).

The Finnish language is one of the Finno-Ugric languages, related to Hungarian, Estonian and some smaller languages. Finnish is unlike most European languages as it is not an Indo-European language. On the analytic-synthetic dimension, Finnish language is quite synthetic, although not at the most extreme end of the spectrum (Miestamo, 2006). As a synthetic language, Finnish composes (synthesises) multiple concepts into each word, unlike analytic languages (such as English) that break up (analyse) concepts into separate words. For example, Finnish language has plenty of inflectional morphemes (e.g. **in** *my* mind – miele**ssä***ni*), compound words (e.g. lesson – oppitunti, lit. knowledge hour) and derived words (e.g. oppi – knowledge → oppia – to learn, opettaa – to teach, opiskella – to study, oppilas – a student, etc.).

Although the Finnish language is grammatically and structurally different from the Indo-European languages, many of the words have been adopted from other languages. These influences are visible in the Finnish Lexicon. Important sources of influence have been Swedish, German and Russian, and more recently English. The oldest educational terminology arrived through Sweden and Russia, when Christianity arrived in Finland from the west and the east.

When Finnish mathematics teachers were asked to describe themselves as a teachers using metaphors, the chosen metaphors revealed that many identified primarily as experts in mathematics teaching (51%), while some saw themselves as experts in pedagogy (14%) and only a few focused on their role as mathematics experts (6%) (Oksanen, Portaankorva-Koivisto & Hannula, 2014).

The following sections outline the process for generating the first version of the Finnish Lexicon and its national validation, and describe some of its characteristic features.

Method

The initial development of the Finnish lexicon

In Finland, the initial development of the lexicon was made by a team consisting of the first author and three experienced mathematics teachers (including the third author), who alternated between viewing and annotating video events, and engaging in discussions to reach consensus on the relevance of each term. When watching and discussing the Finnish stimulus video jointly, we generated 47 terms. We then each watched two stimulus videos from other countries and individually identified terms to describe what happened during these lessons. When meeting again, we also brainstormed possible additional relevant terms. Altogether we generated 290 entries, with some terms identified more than once. In the next phase we discussed the list, removing multiple entries, and deciding which of the closely related terms to keep and which would be sufficiently relevant for the Lexicon. Through this process we ended up with 89 terms that the team agreed to be relevant. After an international Lexicon project meeting, the Finnish lexicon team considered another 23 terms inspired by the discussions in the meeting, leading to a refined list of 105 terms. For each of these terms we wrote descriptions, and specified examples and non-examples, and then conducted a national review.

In Finland, this process of naming events led to a realisation that many of the important events that teachers name in mathematics lessons are not activities, as suggested by the original protocol. For example, the term *kertaus* (revision) is not used primarily as a name for an event, but rather as a qualifier for several different things, such as a revision lesson or a revision task. Other terms that did not refer to activities were *oivaltaminen* (realisation), *tuntisuunnitelma* (lesson plan) and *keventäminen* (use of humour to lighten the atmosphere).

We had a few terms that we found difficult to translate into English as the translation didn't quite capture the same meaning. For example, the translation of *opetuskeskustelu* (questioning) shifts from the original dialogic discussion promoting learning into the teacher testing whether the students have the right knowledge. Another difficult term to translate was *työrauha* (good working climate), where we decided against translating it as "discipline" or "classroom management". Moreover, the Finnish word *ohjaus* (guidance), means "to steer". As the Finnish term relates metaphorically to movement rather than constructing, we decided not to use the English translation "scaffolding".

Procedure for national review of the Finnish lexicon

For the national review of the Finnish lexicon, we conducted an electronic survey with Finnish mathematics teachers in November–December 2016. The aims of the national review were to determine: the familiarity of the lexicon terms among Finnish mathematics teachers, how frequently they use these terms, and how well they recognise them from the descriptions and examples provided.

Moreover, we asked teachers to suggest new lexical terms to be included as well as improvements for the names and descriptions we had generated.

The Finnish national review survey consisted of six sections: (1) Demographics; (2) Questions about the terms (How familiar is the term? How often do you use the term? How often do your colleagues use the term? How often does the phenomenon referred to by the term happen?); (3) Suggesting lexical terms matched to term descriptions; (4) Familiarity of terms, when the full descriptions were given and suggestions for improvements requested; (5) Suggestions for additional terms (6) Thank you and contact information. We used a ~~five~~5-point scale for sections 2 and 4. Four parallel versions of the survey were developed, rotating all lexical terms through sections 2 to 4. In each version each of the sections included 26 terms. Because we were worried about the length of the survey, we encouraged participants to skip the open response items and respond to the multiple-choice items if they were in a hurry.

National review data

The survey was distributed through the national mathematics teachers' union's weekly newsletter to 4400 recipients. The survey was also sent to about 200 recipients through the mailing list of the Finnish Mathematics and Science Education Researchers' Association, as well as to about 20 teachers the first author knew personally. The four different versions of the survey were randomised by asking the respondent to select one of four possible links based on the month of their birthday.

A total of 72 responses were received from mathematics teachers, all meeting the formal qualifications. As typical for Finnish teachers, most taught more than one subject. The secondary subjects taught were typically physics and/or chemistry (53), or computer science (11). Nine respondents taught only mathematics. Most respondents (45) taught at lower secondary level, 26 at upper secondary level, two at elementary level, six at vocational education level and three at tertiary education level. Fifteen respondents taught at more than one level.

The four different versions of the survey received 11 to 25 responses each, suggesting that the randomisation was not always followed. However, the respondents for the different versions represented variation in geography and age. Many respondents skipped the open response items, particularly towards the end of the survey. The number of suggested term names ranged from 4 to 20, and 140 improvements to the term descriptions were suggested. Based on the national review, we refined the Finnish lexicon. There were suggestions for adding a total of 49 new terms to the lexicon. After a review by the research team, we selected 40 terms that we intend to develop for a later national review.

Analysis

We analysed and evaluated the teachers' familiarity and use of terms according to a fixed criterion of at least two thirds of the respondents considering the term familiar or very familiar. When that criterion was not met, we considered the other survey results to decide whether or not to include the term in the Finnish lexicon.

In addition to identifying whether the lexical terms were acceptable for the respondents, we also attempted to identify the most important terms. For the term to be important, we considered four different criteria: high familiarity, frequent usage, the typicality of the event in the class, and easy production of the term based on the description. Moreover, we considered that some terms might be important for teacher language even if not all of the four criteria are met. For example, a term describing a rarely occurring but influential event may be important. Based on these ideas, we defined a term to be important when it met at least two of the following four criteria:

- Rather or very familiar to over 90% of respondents
- Most (>50%) respondents reported that they or their colleagues used the term frequently (2 highest options)
- The respective event occurs frequently (2 highest options) in most respondents' classes (>50%)
- Most respondents (> 50%) are able to produce the correct term or its synonym based on the description provided.

Results

The results section includes an overall summary of the responses and the analysis identifying the most familiar terms.

The refined Finnish lexicon includes 99 terms that are organised into six categories: Kasvatus (Upbringing: 15 terms), Organisointi (Organising: 12 terms), Arviointi (Assessment: 19 terms), Pedagogiset ratkaisut (Pedagogical tools and approaches: 31 terms), Matemaattiset ~~sisällöt~~ termit (Mathematics Specific Terms: 13 terms) and Vuorovaikutus (Interaction: 9 terms). Only 25 terms were expressed by a single word, 26 were expressed as compound words and the remaining 48 terms were expressed as short phrases.

It may be a characteristic of Finnish language that it was not always easy to name events. First, we often had an option to choose between a noun (kehu, a praise) and a verb (kehua, to praise) but sometimes there was an option between different derived versions of the same basic word. For example, instead of *oivaltaminen* (realisation) we could have used the word "oivallus" which, depending on the context,

could mean either a novel idea, or the event of realising an idea. For 12 terms we decided to provide alternative, synonymous names (e.g. *johdanto-/ orientointi-/ pohjustaminen*; introduction-/ orientation).

Familiarity and usage

The national review showed that teacher respondents were familiar with the terms, but not all terminology was in frequent use (Table 10.1). As the familiarity responses did not depend on whether we provided teachers with the term only or a longer description, we combined the two familiarity responses for further analysis. Similarly, the frequency of use was rather similar whether we asked how often the respondent or their colleagues use the term and we decided to combine these data in our future analysis.

TABLE10.1. The mean values and standard deviations for different survey item types

Survey item type		$\bar{x}$	SD
Term only	How familiar?	4.5	0.89
	How often you use?	3.1	1.23
	How often your colleagues use?	3.0	1.14
	How often this thing happens?	3.7	1.14
Full description	How familiar?	4.5	0.85

Most of the terms in the national review were very familiar to almost all respondents, with 72 terms reaching over 4.5 on the ~~five~~ 5-point scale. There were three terms that were very familiar to all respondents: *koe* (tests), *kertaus* (revision), *and demonstraatio* (demonstration).

Nine terms did not meet the 67% familiarity threshold. These terms were *oppilaan pilkkaaminen* (mocking a student), *käänteinen opetus* (flipped classroom), *luokan tai oppilaan antama kannustus* (peer encouragement), *vastauksen vahvistaminen* (confirming a response), *ratkaisun hylkääminen* (rejecting a solution), *työtavan pohjustus* (orienting for a working mode), *opettajan suosikki* (teacher's pet), *avustaja (oppilas opettajan apuna)* (helper; student helping the teacher) *and oppilastyö* (project work). Yet, even these terms were familiar to most teachers, with at least 52% of the respondents finding them familiar or very familiar.

While passive recognition of terms was generally good, some of the terms were not in the active vocabulary of the respondents. When asked about how often the teachers themselves, or their colleagues use these terms, we identified 21 terms that were used seldom or very seldom (i.e. average score smaller than 2.5). These included the nine words below the threshold for familiarity. Among the least frequently

used ten words were also *vastauksen toistaminen* (teacher repeating the student response), *ryhmätyön purku* (group work debriefing), *and brainstorming-/ aivoriihi* (brainstorming). The ten most frequently used terms (in the order of frequency in use), were *koe* (tests), *eriyttäminen* (differentiating), *itsenäinen työskentely* (individual work), *sanallinen tehtävä* (word problem), *kertaus* (revision), *työrauha* (good working climate), *ongelmatehtävä tai pulma* (a problem or a puzzle), *soveltava tehtävä-/ sovellustehtävä* (application task), *itsearviointi* (self-evaluation), and *oivaltaminen* (realisation).

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It is important to note that all words that were familiar to the teachers were not frequently used. For example, the word *demonstraatio* (demonstration) was familiar to all respondents, but its use was just slightly above average at 3.31. The familiarity of the word was probably due to so many respondents teaching physics or chemistry (in addition to mathematics), where demonstrations are a key teaching method. Moreover, the seldom used terms *ryhmätyön purku* (group work debriefing) (familiarity score 4.00) *and brainstorming / aivoriihi* (brainstorming) (familiarity score 3.93), were well known by the respondents.

Important terms

While most reviewed terms were familiar to the respondents, we also used the more selective criteria for identifying important terms in the lexicon (Table 10.2).

TABLE 10.2. The most important terms in the Finnish Lexicon

Category (in Finnish and English) important terms / all terms	**Term (in Finnish)**	**Term (in English)**
Kasvatus (Upbringing) 8/15	*kannustaminen / tsemppaaminen*	encouragement and pep
	keventäminen	use of humour to lighten the atmosphere
	kiusaaminen	bullying
	koulun järjestyssäännöt	school rules
	luokan ilmapiiri	classroom climate
	läsnäolo / välittäminen	caring
	työrauha	good working climate
	työrauhan ylläpitäminen	cultivating good working climate
Organisointi (Organising) 8/12	*aikataulutus*	scheduling
	istumajärjestys	sitting arrangement
	läsnäolijoiden tarkastus	roll call
	ohjeistus	providing instructions
	tunnin aloitus	beginning the lesson
	tuntisuunnitelma	lesson plan
	välineet	equipment
Arviointi (Assessment) 10/19	*arvioinnista kertominen ja keskustelu*	explaining and discussing assessment
	itsearviointi	self-evaluation
	koe	tests
	kokeen palautus	returning assessed tests
	kotitehtävien antaminen	homework assignment
	kotitehtävien tarkistus	checking homework
	palautteen antaminen	providing feedback
	perustelujen vaatiminen	request for justification
	positiivisen palautteen antaminen / kehuminen	providing positive feedback / praising
	tavoitteiden asettaminen	setting assessment goals
Pedagogiset ratkaisut (Pedagogical Tools and Approaches) 11/31	*eriyttäminen*	differentiating
	itsenäinen työskentely	individual work
	johdanto / orientointi / pohjustaminen	introduction / orientation
	kertaus	revision
	koonti / yhteenveto	making a summary

	malliratkaisu	worked-out example
	oivaltaminen	realisation
	ryhmätyö	group work
	teknologian hyödyntäminen	use of technology
	verkkomateriaalin käyttö	use of online material
	vihkotyöskentely	notebook work
Matemaattiset ~~sisällöt~~ termit (Mathematics Specific Terms) 4/13	*oikea terminologia*	correct terminology
	päässälasku	mental calculation
	sanallinen tehtävä	word problem
	soveltava tehtävä / sovellustehtävä	application task
Vuorovaikutus (Interaction) 6/9	*kannustaminen eli tsemppaaminen*	encouragement and pep
	ohjaus	guidance
	oppilaan kysymys	student's question
	oppilaan vastaus	student response
	oppilaiden yhteistyö	student collaboration
	viittaaminen	student raises hand

The important terms included many that relate to the good relationship between teacher and students, such as *keventäminen* (use of humour to lighten the atmosphere), *luokkahenki* (classroom atmosphere), *työrauhan ylläpito* (cultivating good working climate), and *läsnäolo-/ välittäminen* (presence-/ caring).

Many important terms relate to how the lesson can be organised. For example, the following terms more or less define a typical Finnish mathematics lesson: *kotitehtävien tarkistaminen* (checking homework), *johdanto/orientointi/pohjustaminen* (introduction-/ orientation), *malliratkaisu* (worked-out example), *ohjeistus* (providing instructions), *materiaalin jakaminen* (distribution of materials), *itsenäinen työskentely* (individual work), *ohjaus* (guidance), *eriyttäminen* (differentiating), *koonti-/ yhteenveto* (making a summary), and *kotitehtävien antaminen* (homework assignment). Of course, there is some variation, as the terms *oppilaiden yhteistyö* (student collaboration), *ryhmätyö* (group work), *teknologian hyödyntäminen* (use of technology), *kertaus* (revision), and *vihkotyöskentely* (notebook work) indicate.

With respect to teacher-~~-~~student interaction during guidance, we see here some interesting specificity of terminology: *oppilaan kysymys* (student's question), *perustelujen vaatiminen* (request for justification), and *oivaltaminen* (realisation).

Few words specific to mathematics met the criteria of important terminology. There were three terms for specific types of mathematical tasks as well as the term *oikea terminologia* (correct terminology).

Furthermore, the terms *matematiikan teoria* (mathematical theory) and *asioiden rinnastaminen* (connect and contrast) teachers recognised quite well, but used very little.

Refining the Finnish lexicon

Although the majority of the terms were well recognised, some terms or descriptions had to be reconsidered, because the names generated by the respondents did not always match the name we had chosen. For example, most suggested the names "class spirit" or "group spirit" for our description of "classroom climate" (see *luokkahenki* (classroom atmosphere)). As another example, 91% of the respondents recognised the term "exact mathematical language" as familiar, yet none of the respondents were able to produce the same exact term based on the description (see *oikea terminologia* (correct terminology)).

In the validation, we identified 22 terms that received ambiguous evaluation, i.e. the familiarity, usage and term generation provided conflicting results. For example, the three terms that describe an undesirable event in the classroom: "mocking a student" (see *oppilaan nolaaminen* (embarrassing a student)), "teacher's pet" (see *suosiminen* (favoritism)) and *lunttaaminen* (cheating in test) were not used by the teacher and these were not seen to happen in the class. However, teachers were very familiar with these terms and could even name these events correctly. We believe that it is important that the lexicon includes also terminology for undesired events, and hence we decided to keep these terms in the lexicon. However, we used the validation information to refine terminology.

Two other terms that received contradictory evaluations were specific pedagogical practices that seemed to be unevenly distributed among teachers: *käänteinen opetus* (flipped classroom) and *henkilökohtainen palautekeskustelu* (personal feedback discussion). These terms seem to relate to an emerging practice that some teachers already use, some teachers are aware of but do not yet use, and some teachers are not yet aware of.

For some terms, we had been unsuccessful in giving a name familiar to the teachers. For example, the respondents recognised the term "Lesson structure" but they preferred using the term *tuntisuunnitelma* (lesson plan), instead.

Conclusion

The national review of the Finnish mathematics teachers' lexicon indicated that most terms were familiar to the teachers. We have identified and validated 93 terms and included an additional six "nearly validated" terms for a Finnish lexicon for mathematics teachers. Based on teachers' responses and with special attention to the terms suggested for verbal descriptions, we made several refinements

to the initial lexicon. For example, seven of the terms that were validated we renamed for the published lexicon:

- *opettajan suosikk*i (teacher's pet) → *suosiminen* (favoritism)
- *oppilaan pilkkaaminen* (mocking a student) → *oppilaan nolaaminen* (embarrassing a student)
- *opettaja luennoi* (teacher lectures) → *luennointi* (lecturing)
- *oppilastyö* (student work) → *projektityö* (project)
- *eksakti matemaattinen kieli* (exact mathematical language) → *oikea terminologia* (correct terminology)
- *rutiinitehtävä* (routine task) → *perustehtävä* (fundamental task)
- *ongelmatehtävä tai pulma* (problem) → *ongelmanratkaisu* (problem solving)

Furthermore, we combined two validated terms "hoputus" (hurrying) and "tuntitehtävien tarkastaminen" (checking classwork) with another similar term.

We realise that the number of teacher respondents to the national review survey was not high, (especially respondents who completed the least popular version of the survey (11)). Therefore, it is important to get additional validation data to make a more informative judgement regarding unfamiliar terms. In addition, the respondents suggested additional terms for the Finnish lexicon. Out of these we identified 41 terms that we intend to validate at a later stage. The suggested terms include, for example, "open task", "concept map", "learning to learn", "surface learning", "peer assessment", and "responsibility". Hence, the Finnish lexicon is not yet in its final form, although we anticipate that it covers quite well the terminology teachers typically use.

Examining the Finnish lexicon, it suggests that Finnish mathematics teachers conceptualise their teaching primarily through their relationship and interaction with their students, rather than through the teaching of mathematical content. One might argue that the extent of terminology related to a topic is not necessarily an indication of the perceived importance of that topic. However, if there is significant and continued attention and discussion on a topic, would that not inevitably lead to a more detailed vocabulary to foster such discussions?

When comparing these results with the earlier metaphor study conducted by Oksanen et al. ~~and colleagues~~ (2014), we can see that the results of both studies suggest a primary focus on teachers' expertise in organising and orchestrating mathematics teaching, while some attention is given to general pedagogy ("Kasvatus"), and rather little attention is placed on mathematical content knowledge. Taken together, these studies indicate that the main focus of Finnish mathematics teachers – at least as

expressed in their language – is on the act of teaching. They do pay some attention to student learning, but quite little to the mathematical content. Furthermore, in Oksanen and colleagues' study (2014) the metaphors were dominantly about learning as movement and teaching as guidance. This is nicely aligned with the Finnish term for scaffolding *ohjaus* (guidance) included in the Finnish Lexicon.

Hänninen, Iltanen and Öz (2018) have already used the draft lexicon to review the use of the terms from the Finnish mathematics teachers' lexicon in Finnish National curricula from 2004 and 2014. They found multiple differences in the use of different terms between these curricula. Most notably in the new curriculum, the terms *kannustaminen* (encouragement and pep) and *eriyttäminen* (differentiating) had replaced *päättely* (deduction) and *ongelmanratkaisu* (problem solving) in the list of five most frequently used lexical terms in the curriculum as a whole. *Ohjaus* (guidance) in a general sense was mentioned significantly more frequently in the new curriculum (1686 mentions) than in the old curriculum (131 mentions). They also found some of the terms only in the new curriculum, for example: *läsnäolo* (presence), *oppilaan kysymys* (student's question), *tutkimustehtävä* (investigation), and *kasvatuskeskustelu* (discussion about student behaviour). Their conclusion was that the changes demonstrate a change towards a more individual approach concerning students.

While the Finnish Lexicon provides a progressive view regarding teacher-student relations, it also reflects a rather conservative view regarding teaching methods in Finnish mathematics classrooms. Yet, new teaching and assessment methods are emerging in Finnish classrooms, reflecting the new National Curriculum (Finnish National Board of Education, 2014). A broader view of assessment focusing more on guidance and other ways of formative assessment are highlighted in the new curriculum, as well as larger cross-subject projects and phenomenon-based studying. Some terms that did not meet the familiarity criteria of the validation but were well recognised by some teachers may well be on the verge of becoming mainstream educational vocabulary, or they are stabilising their place in Finnish educational vocabulary as terms of phenomena that are already present and expanding in Finnish schools. The Finnish Lexicon may provide teachers the needed vocabulary to help the transition to new methods and support discussions about them among colleagues.

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