QUESTIONNAIRE FOR MATHEMATICS TEACHERS – ANALYSIS NORWAY

The quantitative part:
Answers were received from 26 teachers from 7 different regions of Norway. Of these teachers 12 teachers are primary teachers, 10 lower secondary and 4 upper secondary teachers.
All of them are teaching other subjects besides mathematics, such as Norwegian, English, religion, art, sports, music, social science, natural science, chemistry , physics, economics, justice, special pedagogics, media, ICT and so on.
The average length of teaching is 19.1 years varying from 2 months to 36 years and the average length of teaching mathematics is 17.3 years varying from 2 months to 36 years.
Almost all teachers claim that they got no training or education for teaching in multicultural classes.
Four teachers are working in places with 1001-5000 inhabitants, 3 teachers in places with 5001-10000 inhabitants and 19 teachers in places with more than 10000 inhabitants.
The regions (fylke) represented are Troms, Oslo, Narvik, Vestfold, Vest-Agder, Aust-Agder and Rogaland, representing areas from the far north to the south of Norway.
On average 8.3 % of pupils are immigrants, varying from 0 (in 11 cases) to 40 %. 10 teachers reply that the school has an official programme for support of immigrant children, mostly a programme for teaching Norwegian as a second language. 62 % of the teachers have taught immigrant pupils at some occasion.
58 % of the teachers have met special problems when teaching immigrant pupils.
12 teachers found appropriate material for teaching in multicultural classes; 11 teachers shared the problems with other teachers; 8 teachers received support from the school management; and 11 teachers saw advantages in teaching immigrant pupils.
9 teachers claimed that they changed their teaching methods when teaching a multicultural class.
Concerning support and environment the number of answers with yes from teachers were in 13 a) 15, 13 b) 17, 13 c) 13 and 13 d) 16.

From the qualitative part of the questions:
Concerning question 4 the following comments are given:
There were hardly any multicultural pupils when I took my education (32 years ago). I am currently taking part in in-service education but this has not been a theme. I have taught multicultural classes when I had pupils from other cultures, 1-3 per class. (Answer 11)
I read a paper about ethno-mathematics. No, but I generally search for how all pupils think. (Ans 18)
No education but we are a receiving school so we get training every day. Minor courses arranged by the school were offered. (Ans 26)

Question 8: Norwegian as second language (3). We have one class where all pupils are accepted on special conditions because they have lived a short time in Norway. There are specific resources for these pupils (6). We have a special class where these pupils are taught. When they are ready for it they come into normal classes, first in practical subjects (7). Yes, in Norwegian (12). Norwegian-2 offer, but my impression is that it is up to the teacher who gets these lessons to choose content (which is normal in Norwegian-2) (16).

Question 10:Language problems and cultural and other differences (1).Lack of language and concepts.Another algorithm for multiplication (4). It varies how well the pupils know Norwegian and how good they are in the studies. Some are weak in Norwegian, but strong in subjects. Others are good in Norwegian (maybe born in Norway) but weak in the subjects. As ethnic Norwegian pupils. There are a few pupils who are weak in both Norwegian and the subject and it is problematic to teach them because they are often far behind (6). Difficult to know what is lacking conceptual learning from before or if it is language problems. To discern specific mathematical difficulties or are they to be blamed lack of understanding because of limited language acquisition? (11). Language becomes a barrier (12). Language problems – the pupil came directly from a refugee camp in Etiopia (13). Difficult because the pupils do now know Norwegian (14). Do you mean own classes with immigrants? Or classes containing immigrants? My problems are to help immigrant children to develop good concepts for use in mathematics. What concepts are central and how can we train them without working concretely, which is time-consuming and binds much teacher resources. I wish an overview with concepts grouped after how basic they are for example the number names be more basic thatn more, fewer, as many as. Especially hard is it with pupils who speak good Norwegian and seems to be as good as the others. Then they fall through in single subjects because they lack the basic concepts, which all take for granted that they can. New pupils in Norway and the youngest pupils in first and second class will first of all demand the oral concept. They also need to say the words themselves and use them in practical situations. Pupils who learn other algorithms at home than in school. This creates frustration for both pupils and parents. It would be good to know a little about other algorithms and ask the pupil to choose (usually they want to count as other do) (16).

Descriptions

a) of materials: I found literature and concrete material based on values (3). Focus on conceptual learning (4). I take longer time to explain the content and ask them to formulate the question in such a way that they understand what they are asking for (6). I talked to the first language teacher and investigated if he could check the concepts and understanding in the first language, possibly assist with the learning of mathematics for this pupil in the same way as I did in the common class. I found suitable material but cannot remember what it was (11). The pupils got textbooks for primary school pupils (12). The pupil worked initially much with the four operations-as he had some knowledge about that (13). Difficult to find textbooks that do now demand good knowledge of Norwegian (14). Now I assume you mean groups with pupils with 2 languages. I have only had lessons with one pupil alone. Then I did not search for material but had lots of different things. For example blocks which we talked about with concepts linked to size, big, small, bigger, broader, thinner, longer, higher and so on. Or other times words for places: in front of, behind between …(16).
b) shared problems: I talked a lot with colleagues with more experience and math colleagues. Also got help to map difficulties andfind material. (3). Learnt about the algorithm and talked with the pupil and agreed about the most adequate one (4). Yes, we do exchange experiences a lot at our school (11). Yes, with a special teacher who worked with other children in the class (13). Partly, but since there are so few immigrant pupils in our school there are few teachers in the same situation (14). Yes, the conceptual structure is linked to first language learning. The teacher who is main responsible and the Norwegian teacher can naturally talke about these things (16).
c) support from school management: They helped me with support from the resource team which has been created at the school. They were interested in how things developed (3). The management was not directly involved (4). I did not talk to the

school management as I solved the problem with the first language teacher (11). Later the first language teacher also entered the scene, and took some teaching in mathematics (13). Little support (14). No, but I think it is because of lack of trust (16).

d) advantages: Norwegian students learnt about other cultures (1). What she was helped from, several other students had help from. Not least in relation to concepts and concretisation. It helped to focus on concepts and understanding of content and weak concepts/experiences with several pupils (3). Contributes to create tolerance, respect and understanding for other cultures. Created concrete insight in another algorithm (4). It is helpful with variation because then different solution methods can be presented (6). The advantage is to get new approaches in ways of thinking which we can share. Additionally this is a richness in other subjects also (social science, religion…) (11). No, they are as pupils commonly, but not special for immigrants (12). With mathematics glasses on? No. With contact teacher's glasses on, yes. Pupils get insight into other cultures, religions (16).

12 You have to be more distinct (1). I became more aware of pupils' background of experiences in relation to mathematical concepts. Quicker to create experiences for pupils and work with language (3). Had to be more awake especially in relation to language and the concepts you use. Was careful to see the pupil after instruction of new material in order to be sure that she understood what we had went through and talked about. Had to be more aware and careful about how I presented about Islam (4). Not especially because of immigrant pupils. I use many strategies because pupils think in different ways. We talk much mathematics in lessons where pupils explain to each other how they think… also immigrant pupils (11). Yes, more clear instruction, more repetitions (12). I tried to find suitable approaches for these pupils. Difficult to get them along in ordinary teaching in the class (14).Tried to have more focus on concepts with the concepts of the week in first class. I cooperated with the Norwegian teacher. Think ti was good for all pupils, maybe except for the pupil who had 2 languages with non-Norwegian speaking parents and got no help at home (16).

13 a) Maybe.Have not met such things yet so it is difficult to say (6).Mathematical approaches that do now assume good knowledge in Norwegian (14).As mentioned overview of basic concepts.Preferably with visual picture cards (16).
b) All pupils come from different families with different cultural backgrounds and are raised differently. Could rather have focused on each individual pupil's background than the whole minority-group (6). You get that little by little (14).c) Maybe. Had been interesting to see how different culture look upon education (6). I do not think the cultural background is the most important (14). It is useful to know how many years of schooling the pupil has got in the home-country. And a little about what is emphasised in mathematics teaching there. It was useful for me to read Hvenekilde, it has some overview of different algorithms used in other countries. It is useful in the meeting with both pupils and parents (Anne Hvenekilde, 1988, "Mathematics in a language we understand!": pupils from language minorities and the mathematics. Oslo: Cappelen) (16).
d) I have little experience from this and thus it is difficult for me to answer, but it would probably be most helpful with information (4). More careful follow-up of each pupil demands making free time for this (6). As I am not teaching these pupils I have not thought about the problems (7). Have not worked with the problems (9). I think I do not need special mathematic material for immigrant pupils, but use the material we have in the school, and this has been complemented much in later years in addition to visualisation with Smartboard. We have material pupils themselves can manipulate in order to train practically and transpose this

to abstract thinking later on. To get information about the cultural background of the pupil is useful in order to easier help the pupil. Parents are part of the child's tradition and can maybe have more difficulties in helping the child. It is important for the teacher to understand their background and possibly draw their culture in where it can make the teaching richer and put the immigrant pupil in focus (11). Easier access to interpreter (12).Information about the background of the pupil both socially and about subjects. Get education or courses about how to teach multicultural pupils (13).Could use diagnostic tests in order to find the level. They should rather not assume special knowledge in Norwegian. A special textbook with pictures, numbers and exploring tasks. Teaching approaches on the internet. Learning of concepts and basic skills in mathematics (14). No need as I am not teaching in multicultural classes (15).
Preferably app's or computer-programs where pupils interactively can train concepts. Linked to mass, time, number, position , ... In this way pupils can work at home or independently in school without needing a teacher resource all the time. I mean it should be technically possible that the pupil himself writes the word and then can hear it or the teacher can collect the iPad and control that the word is correctly pronounced. Parents to bilingual pupils often wish to help. Then it could be fine to show our standard-algorithms and explain them visually on the internet with supporting concrete material or where one could choose explaining voice in different languages (16).