TEACHER EDUCATION AND ETHICAL AWARENESS, HUMAN DIGNITY AND DEMOCRATIC PARTICIPATION

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Three of the core values in the Norway curriculum are ethical awareness, human dignity and democratic participation. In this report, we highlight how mathematics educators in teacher education include these values in their teaching. Results show that they put different emphasis on the three values, and their approach to teaching varied. Some chose to work explicitly with the values during a session, focusing on learning about the values, for example how they are presented in the curriculum. Others chose to have the values as a red thread through the whole course, putting emphasis on learning through the values, enacting them in class. Statistics and mathematical modelling were seen as easier to connect to the values. Both challenges and opportunities were addressed. We discuss implications of the results.

INTRODUCTION

Ethical awareness, human dignity and democratic participation are three out of six core values in the Norway curriculum (Ministry of Education and Research, 2019). This means that they apply to all school subjects, including mathematics, but have received limited attention in mathematics teacher education literature, with democratic participation as an exception. Human dignity in the curriculum is seen as connected to human rights, in terms of equality a. It is stated in the curriculum that students need to have opportunities to reflect on and to support the protection of human dignity. Ethical awareness is first of all about ethical dilemmas, giving pupils possibilities to recognize ethical issues and to make ethical assessments by considering different considerations and weighting them. Last, but not least, democratic participation is connected to giving students possibilities to learn what a democratic society is and what democratic values are, recognizing diversity, and experiencing that they have a voice and being heard. Human rights values are at the core of the Norwegian curriculum such that education should comply with them (Ministry of Education and Research, 2019). From here we simply call these three values as the Values.

In reviewing research on mathematics education and democracy, Aguilar and Zavaleta (2012) identified three links between the two: mathematics education as a provider of the critical skills that students need to be democratic citizens; mathematics education as a source of (democratic and undemocratic) values and attitudes; and mathematics education as a social gatekeeper restricting students' opportunities for advancing or civic participation. They further identified the use of mathematics, for example,

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mathematical modelling and applications, as a thinking tool for societal problems, as well as to promote democratic values and attitudes by making students experience democratic life in the mathematics classroom. The teacher's attitudes, such as commitment to the democratic classroom and willingness to work with uncertainty, and their mathematical and pedagogical skills, such as recognizing the role of mathematics in society and being able to orchestrate the dynamics in a democratic classroom, are pointed out as fundamental for mathematics education for democracy.

Hauge et al. (2024) give examples of ethical awareness among teachers and teacher educators who reflect on challenging situations when working with socio-political issues in their mathematics classrooms. However, the focus of the chapter is not on how they deliberately work with ethical awareness in their teaching practice.

Drawing on Hawthorne's conceptualization of dignity as rooted in self-respect and self-worth, qualities often diminished by systemic inequities, they highlight the ethical responsibility of educators to create spaces where learners feel valued and respected.

In the context of recognition and reconciliation, Stathopoulou and Appelbaum (2016) challenge dominant narratives of success by asking: *"How can school mathematics support the dignity of each student and their families, rather than simply raise achievement?"* (p. 35). This question reframes educational priorities, shifting the focus from performance metrics to relational and humanistic dimensions of learning. Similarly, Scott and Philip (2023) underscore the significance of classroom interactions, noting that mathematical activity when learners' minds, humanity, and potential are acknowledged and respected (p. 293).

Across these perspectives, values of human rights and dignity emerge as a central concern in mathematics education, both as a guiding purpose and as an outcome shaped by pedagogical practices. Yet, while these issues are often explored in school mathematic teaching, learning and classrooms, less attention has been given to the how mathematics teacher educators take up the challenge of including values in their university teacher education programs.

The ViMTE project (*Developing Human Rights Values in Mathematics Teacher Education: Education with and by Youth*) aims to achieve insights in how mathematics education can be connected to human rights values. Therefore, we ask:

How do mathematics teacher educators reflect on their teaching related to the Values?

To answer this question, we have interviewed, and had meetings and workshops with, mathematics teacher educators who have had various roles in the ViMTE project and who adapted their teaching after being part of ViMTE. We use the framework developed by Robinson et al. (2020), which presents various emphases and approaches teachers may have to include human rights in their teaching. We adjust the framework to fit mathematics education, teacher education and the three values: human dignity, ethical awareness and democratic participation.

THEORETICAL FRAMEWORK

The theoretical framework is inspired by the Declaration on Human Rights Education and Training (United Nations General Assembly, 2011), which stresses the need for various approaches to human rights education. The declaration categorises three necessary, but different, approaches: education *about* human rights (which denotes human rights knowledge), education *through* human rights (which denotes a pedagogical approach where the rights are enacted) and *for* human rights (which intends to empower the students to defend human rights in their lived and future lives).

Robinson et al. (2020) developed a framework based on these approaches and human rights frameworks to categorise educators' responsibilities. Their framework consists of three dimensions. The first is *knowledge and values*, which is related to teaching *about* human rights and consists of two responsibilities. One is to raise awareness about human rights, and the other is to understand and raise awareness about the human rights values. The second dimension is *attitude and environment*, which is about creating an environment where both the teacher and the students acknowledge, respect and perform human rights in class. This is related to teaching *through* human rights values. The last dimension is *agency and action*, which is about encouraging students to defend and exercise their own and others' rights. This is related to students' lives in general, outside the classroom and in the future, and is thus similar to UN's notion: to educate *for* human rights. The dimensions are seen as overlapping and building on each other.

In our study, we adapt the framework of Robinson et al. (2020) to the context of mathematics education, where human rights may—or may not—be explicitly foregrounded. Mathematics can serve as a tool for illuminating the three selected values, aligning naturally with the first dimension, *knowledge and values*. At the same time, these values can be integral to the teaching of any mathematical topic even without explicit reference to human rights, which resonates more clearly with the framework's second and third dimensions. A further adaptation is that the framework is applied not only to teacher education but also to preservice teachers' own classrooms, whether during practicum or in their envisioned future teaching contexts. This means that the dimension concerned with *agency and action* encompasses what teacher educators encourage their students to enact in their mathematics classrooms. Finally, while the original framework emphasizes teachers' responsibilities, given research showing that schools have historically paid limited attention to rights, our interest lies instead in what teachers actually do and how they reflect on these practices, rather than in evaluating or prescribing their responsibilities.

METHODS

The data is collected within the ViMTE project, where an aim is to improve mathematics teacher education. The teacher educators in this study have volunteered to be inspired by ViMTE to include the Values in their teaching.

The data for the present paper includes video recordings of three interviews with mathematics teacher educators (MTE) after they have joined various activities in the ViMTE project. These were two project meetings, a workshop at a human rights center and a workshop with an exhibition of artefacts which lower secondary school students had created, illustrating how they saw connections between mathematics and the Values. The teacher educators represented in our study are Sue, Nina, Martin, May and Elsa. Sue (a participant) and Nina (a ViMTE researcher and a participant) share the responsibility of a mathematics course for third year students. Martin (a participant) outsourced two days (6 hours class) of his mathematics course for second year students to May and Elsa (both ViMTE researchers). The data from the interviews were transcribed and anonymised. The interview questions were guided by the three dimensions in the Robinson et al. (2020) framework, which is also the basis for the analysis. In addition, we asked about connections to mathematics and mathematics education.

ANALYSIS

Sue and Nina's called their classroom a "The democratic classroom", it concentrates on mathematics education and pedagogy and less on exercising mathematics skills. During the interview, Sue and Nina highlight democratic participation as a key value and a red thread throughout the course, but state that they see human dignity and ethical awareness as sub-values of democratic participation. They repeatedly explain the importance of developing an environment for valuable conversations, letting all the preservice teachers be heard, learning the names of all the students and doing activities so that the preservice teachers get to know each other as they come from different campuses. This suggests that they emphasize education through democratic participation, and what Robinson et al. (2020) denote as a focus on attitude and environment. Learning the names and letting all voices be heard is also related to human dignity, so that both democratic participation and human dignity are enacted values in their classroom.

Sue and Nina explain that one of their aims is to offer exemplary teaching which their students can learn from and apply in their (future) classrooms. We interpret this as an encouragement for preservice teachers to get a sense of agency and take action by incorporating democratic participation in their teaching, in line with Robinson et al.'s third dimension. However, to make the preservice teachers aware of Values, Sue and Nina point out two strategies. One is to make the Values explicit by reflecting on their significance. The other is to introduce the core curriculum values to the preservice teachers and let them work on how to connect mathematics to the Values. Both are in line with the first dimension, teaching about the Values.

Sue and Nina find that democratic participation is easier to connect to mathematics than human dignity and ethical awareness. Sue explains it this way:

> Ethical awareness and human dignity are more on the personal level, and not so easy to connect to mathematics. But there is a mathematical model for everything that happens around us in society. You can just make it if it's not available.

Sue links democratic participation to mathematics through mathematical modelling, pointing to its societal relevance. However, the course's educational focus limits practical integration, and they suggest collaborating with the parallel mathematics-content course to reinforce the Values in preservice teacher preparation.

Both Nina and Sue suggest that the mathematics subject can have another role in addressing challenging issues than other school subjects. Nina exemplifies this, referring to a news article on disagreements on counting the demonstrators against immigration that took place in London September 13th, 2025. Students could start off with the different counts, compare this with the available space and then discuss whether this is possible, considering the number of people per square meter this would result in. The calculations could be followed by a discussion on who the different counts supported. She argues that this way mathematics has an opportunity to shape discussions differently. Sue supports this and adds that this can feel less risky than asking students to take a position on political claims.

This shows that issues related to democratic participation (the demonstration), human dignity (how to treat immigrants) and ethical awareness (the ethical dilemmas) can be perceived as challenging to cope with in classrooms, but that mathematics can be helpful in making the discussion less "risky".

Sue and Nina seem to be in a process of development. They plan to cooperate with the other mathematics teacher educators, and they emphasize that they themselves are in a process of learning how to implement the Values. Nina expresses it this way:

> Knowledge about the Values, both concerning the [Robinson] framework and the connections to mathematics, is a process where you develop more and more consciousness about them, which makes you see possibilities, that the possibilities become more apparent when you have worked with them.

This suggests that they might continue to develop their teaching in all three dimensions of the Robinson framework.

During the interview with Martin, he explains that he does not work notably with the Values, but he gave an example of education *through* democratic participation where his students partook in developing a list of aims relevant for their exams. He considers including real-life topics in his teaching after feedback from students in the ViMTE project who regarded mathematics education as detached from the world. He underlines that it needs to be problems that the preservice teachers find real and relevant, such as the UN sustainability goals (SDGs). Because the goals are related to all human rights, his ideas are in line with education *about* the Values. His ideas are also in line with education *for* the Values, as working with the SDGs may lead to agency and action. He thereby touches upon all the three dimensions of the Robinson

et al. (2020) framework, but he expresses a concern for incorporating sufficiently sophisticated mathematics, and not only what he calls “banal” mathematics.

May and Elsa started with letting the preservice teachers get acquainted with how the Values were explained in the curriculum, giving them various tasks and letting them discuss how the Values could be connected to mathematics. The first day is thus in line with focusing on the dimension of knowledge and values in Robinson et al.’s (2020) framework. It is worth noting that May feels she has limited knowledge about the Values. The second day, the preservice teachers are asked to develop teaching related to the Values, which can be denoted as facilitating agency and action in the framework.

May offers the following reflections during the interview:

> It gave me the insight that this is absolutely a topic that also preservice teachers think is important, but they need to be introduced to it and get an explanation of what it is. […] And my experience was that preservice teachers are very willing to learn and explore how to work with this. And they understand that we don’t have any definite answers, so they become motivated to be part of that process.

May’s reflection supports that, at least some preservice teachers experienced agency in a profound way and where May and Elsa had developed an environment for this agency. In addition, Martin suggested that the preservice teachers could use what they had developed in practicum or as substitute teachers. Taken together, their teaching fulfilled all three dimensions of the Robinson et al. (2020) framework, where all three Values were present. The values democratic participation and human dignity were significantly represented in that the preservice teachers felt they were contributing to something they found important, which again witnesses a feeling of respect and human dignity. Thus, the second dimension related to attitude and environment was emphasized in May and Elsa’s teaching. However, they explained that the preservice teachers included democratic participation in their teaching tasks and just mentioned ethical awareness and neglected human dignity. Two explanations were offered: the national election took place the following day, and Democracy and citizenship is a multi-disciplinary topic emphasized in the curriculum.

May and Elsa reported that the preservice teachers saw statistics and mathematical modelling as relevant for working with the Values. However, both pointed out that mathematics is more than calculations, but that it may be necessary to show how to the preservice teachers, “we can’t teach mathematics as if it’s distant from life, right?”

RESULTS AND DISCUSSION

To summarize, all the mathematics teacher educators we interviewed include different ways of working with the Values in their mathematics classes and which can be connected to all three dimensions in Robinson’s (2020) framework. May and Elsa put more emphasis on learning *about* the values, for example how they are presented in the curriculum, while Sue and Nina chose to have the Values as a red thread through a longer time or the whole course. Thus, they put emphasis on learning *through* the

values, enacting them in class as part of the environment, fitting with the ideas by Aguilar and Zavaleta (2012) about the teacher's commitment to the democratic classroom and showing pedagogical skills to orchestrate communication in such a classroom. They all see the curriculum as a good starting point to learn about the values, but also to make preservice teachers aware of the relevance of the values in mathematics teaching at school. This can be connected to the last dimension in Robinson (2020), *action and agency*, in which the mathematics educators encourage preservice teachers to engage with the values in their practicum by creating activities that require them to formulate tasks for their students that involve the values. Using mathematics to promote democratic values is a characteristic of the connections between mathematics education and democracy (Aguilar & Zavaleta, 2012). Another important finding is that all of the interviewees express the idea to do exemplary teaching through the values by creating an environment that gives preservice teachers experiences that are relevant for their action and agency.

Democratic participation was most explicitly expressed during the interviews. Sue and Nina argued that this value is easily connected to mathematics given its societal relevance, while human dignity or ethical awareness were perceived as more individual. Similarly, May and Nina’s students were more focused on democratic participation, somewhat overshadowing the two other values. We suggest that this gives reason to further develop ways to connect mathematics to human dignity and ethical awareness. For example, what about digging into statistics on human rights violations, or considering two sets of statistics that emphasize different consequences of a political decision?

Nina and Sue suggested that the mathematics subject can offer other ways to approach sensitive issues where the Values are at stake. This is an interesting point that should be explored. What other good examples would there be besides counts in demonstrations? How is this approach different than role play in social studies class, where the idea is to avoid forcing students to defend their personal views on sensitive issues. On the other hand, does avoiding listening to students’ opinions prevent them from democratic participation? How can this be balanced?

Martin was concerned that focusing on the Values would result in what he called “banal” mathematics. This is a concern we think should be taken seriously. Do mathematics educators have sufficient resources, examples, to meet this challenge? Do we need frameworks for developing such resources?

One important contribution we bring to the research in mathematics education is on adapting the Robinson et al. (2020) framework about ways of teaching human rights into the mathematics education field. This adaptation gives us possibilities to reflect on different ways of approaching the Values in the mathematics classroom. As discussed earlier, the knowledge and value dimension can be about connecting the values to the mathematics curriculum. The action and agency dimension is also connected to mathematics, as mathematics teacher educators propose exemplary

teaching and activities that can support the preservice teachers' agency to bring the values out in their mathematics classrooms. The attitude and environment dimension is more general, in the sense that creating for example, a democratic environment in the classroom can be similar in mathematics as in other subjects. However, because the original framework is designed for teaching human rights rather than mathematics, we further adapt it to examine how mathematics connects to these values and to explore the forms of mathematical understanding that become possible when the values are intentionally integrated into mathematics classrooms.

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References

Aguilar, M.S., & Zavaleta, J.G.M. (2012). On the links between mathematics education and democracy: A literature review. *Pythagoras, 33*(2), Art. #164, 15 pages. http://dx.doi.org/10.4102/pythagoras.v33i2.164

Hauge, K. H., Kacerja, S., Lilland, I. E. & Steffensen, L. (2024). Layers of ethical awareness: Mathematics teachers' concerns on including socio-political issues. In P. Ernest (Ed.) *Ethics and mathematics education - The Good, the Bad and the Ugly*, p. 415–439. Springer.Ministry of Education and Research (2019). *Mathematics subject curriculum*. Retrieved from https://www.udir.no/lk20/mat01-05

Robinson, C., Phillips, L., & Quennerstedt, A. (2020) Human rights education: developing a theoretical understanding of teachers' responsibilities. *Educational Review, 72*(2), 220–241. https://doi.org/10.1080/00131911.2018.1495182

Scott, M., & Philip, T. M. (2023). "We ask so much of these tiny humans": Supporting beginning teachers to honor the dignity of young people as mathematical learners. *Cognition and Instruction*, *41*(3), 291-315.

Stathopoulou, C., & Appelbaum, P. (2016). Dignity, recognition, and reconciliation: Forgiveness, ethnomathematics, and mathematics education. *Revista Internacional de Pesquisa em Educação Matemática*, *6*(1), 26-44.

United Nations General Assembly (2011). *United Nations Declaration on Human Rights Education and Training.* General Assembly Resolution 66/137, 19 Dec. U.N.Doc. A/RES/66/137.