

Fridays for Future: Dealing with controversial issues in schools

What does a school strike mean for teachers and school leaders, and what tensions arise when they must respond to such protests? To address this question, we first give an overview of theoretical insights and empirical findings. Based on a survey of Fridays for Future participants, we then examine how students perceived teachers' and school leaders' reactions to the strikes, and discuss the findings in the context of school development.

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Abstract

The Fridays for Future (Fff) school strikes represent a protest movement advocating for a sustainable future while simultaneously challenging the current institutional framework of schools. The characterization of Fff as school strike needs a response from teachers and school leaders, an aspect that has received limited scholarly attention. The movement is compelling both teachers and school leaders to adopt a stance on the strike and to take a position on controversial issues. But there is a lack of professionalization among educators regarding their approach to addressing controversies in the context of climate policies. At the same time, teachers and school leaders must directly respond to the absence of students. This article aims to explore the manner in which controversial topics can be addressed in schools, with a particular focus on the example of Fff. We outline challenges that teachers and school leaders face in relation to Fff and present theoretical and empirical insights into how to deal with controversial issues. Moreover, we present initial findings pertaining to the students' perceptions of the teachers' and school leaders' responses to Fff.

Keywords

controversy, Education for Sustainable Development, Fridays for Future, school development, school leader, school principal, school strike, teacher

In recent years, the international social movement Fridays for Future (Fff) has become important and impactful for sustainability debates (Andres et al. 2022). Especially before the COVID-19 pandemic, the protests for a more ambitious climate policy brought together thousands of people in many countries (Haunss et al. 2020). Although Fff developed its discursive power for a limited time, the relevance of the issues endures. The protests are specifically framed as a school strike, prompting extensive public discourse. This framing raised the question of the type of education necessary for the younger generation to effectively address contemporary crises, such as climate change and its widespread implications. What is the appropriate, required and permissible behavior of educators in situations of complexity and political controversy, and which challenges emerge when engaging with controversial topics within an educational context? We take these questions as a starting point for a critical examination of the handling of controversy within the school context.

The global school strike demonstrated that students all over the world are highly motivated and interested in making a difference (see, e. g., Costa and Wittmann 2021, Wallis and Loy 2021). Although this motivation is a promising basis for further educational processes, research has only begun to pay attention to the pedagogical aspects of Fff. There are initial efforts to address the movement from an educational perspective (e. g., Budde 2020, Singer-Brodowski and Bui 2023, Herzog 2021, Eckermann 2021), also focusing on the potential links to more institutionalized educational concepts such as citizenship education (e. g., Kenner 2021), education for sustainable development (ESD) (Holfelder et al. 2021) or climate change education (CCE) (Deisenrieder et al. 2020). Nevertheless, these contributions remain rather general and do not account for the fact that teachers and school leaders have seldom had to deal with political issues as directly as they have in the context of school strike: While the unique situation of the school strike presents challenges for teachers and school leaders, only some feel prepared to address political and controversial issues and thereby take the issue as well as the students' perspective on the issue seriously.

In this article, we take up Fff as a catalyst for reflection on the existing knowledge regarding the handling of controversial

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issues in educational settings from an educational science perspective. We use the example of FfF as a starting point for conceptualizing and discussing the role of political, controversial and complex issues in educational institutions.

Subsequently, this article aims to explore ways in which controversial issues can be dealt with in schools. To this end, we will first describe the particular significance of FfF for questions of an often perceived “neutral positioning” in schools. We will then proceed to discuss empirical insights on attitudes of teachers and school leaders in regard to their handling of controversial issues. In order to gain a deeper understanding of the perspectives involved, the article additionally presents results from a German study that examines students’ perception of school stakeholders’ reactions to FfF. By including the students’ viewpoint, the article broadens the scope of consideration offering a more comprehensive view on the educational process. Finally, the article concludes with an analysis of the key findings at the level of teachers, school leaders and students.

Fridays for Future as a catalyst for controversial debates

Because the FfF protests are school strikes, they are in conflict with compulsory education (Keyser 2022). This brings the relationship between schools and socio-political movements into focus. Although school strikes are not new in history, they are a new form of action in the context of climate protests (Rucht and Rink 2020). In particular, FfF has mobilized significant numbers of children and youth, stimulating broad public discussions on how to respond to school strikes (e.g., Hanschmann 2019, Goldenbaum and Thompson 2020). FfF confronts the institution of school with fundamental questions by asking whether the current kind of education is useful for the future and a sustainable transformation. As in a normal strike (in a democratic system), the protest is a reasonable way of expressing dissatisfaction with the system, in this case the educational system and climate policy. This form of political participation can even be described as a fundamental element of the educational objective of democracy education in schools.

The FfF movement has succeeded (at least for a period of time) in placing the issue of climate change at the forefront of public discourse (Andres et al. 2022) and has inspired numerous young individuals to become politically engaged. From the perspective of civic education, this is an encouraging success. Nevertheless, the public discourse involved a contentious debate. While the scientific community is largely in alignment with the movement’s core demands to act on the scientific consensus on anthropogenic climate change, there is considerable public debate on three key issues: firstly, the specific strategies for climate policy; secondly, the role of individual action and individual responsibilities in driving sustainable transformation and, thirdly, the scope and forms of political protest on the student level.

These three aspects can serve as a useful starting point for discussing highly relevant topics of climate policy, responsibilities and political participation in schools and thereby function as a catalyst for thinking about professionally dealing with controversies in schools. The FfF protests provide a unique opportunity to engage in meaningful discourse on topics that are closely aligned with the lived experiences of students. Despite the existence of different phases of FfF activities and variations in the nature of school strike activities prior to, during and following the pandemic, it is possible to perceive the attendance of students in the movement as an occasion for reflection on the manner in which controversial and multi-faceted issues are addressed within the school environment. Because the non-attendance of students can hardly be overlooked, teachers and school leaders are required to respond to their absence. This raises the question of whether educators are obliged or even able to maintain a “neutral” stance on political matters within the educational context, or more broadly, how to address controversial and political issues in an educational setting.

Challenges in dealing with Fridays for Future: Empirical and theoretical spotlights

School leaders and teachers play a key role in creating a supportive (or unsupportive) environment for students, as they can influence and actively shape the school’s atmosphere and culture. However, teachers and school leaders each face specific challenges when dealing with controversies in school. While teachers are particularly concerned with classroom decisions, school leaders are faced with overarching issues (in case of FfF, e.g., whether to take disciplinary action in relation to the absence of students). The following sections describe the challenges associated with responding to FfF. Building on this, we present empirical findings from the field of educational science to gain a more nuanced understanding.

Teacher

At the classroom level, the FfF protest prompts the question of what is required of teachers in order to integrate current topics relevant for shaping a sustainable future into their lesson plans. How can teachers utilize their professional freedom and flexibility within the context of their commitment to the curriculum? Teachers need the ability to link current topics to subjects taught and to deal with uncertainties beyond the established curriculum. As there is always more knowledge to be gained, educators must navigate the complexities of the unknown and inherent ambiguities (see, e.g., Scheunpflug 2011, Costa et al. 2018). Furthermore, FfF addresses issues that are widely and often controversially discussed in society. The approach taken by the teachers to these topics is thus informed by a number of factors, including the specific content knowledge, personal values, visions, and perceived conflicting positions (Breitenmoser et al. 2024). This gives rise to the question of what constitutes a professional approach



in that context and how teachers deal with these challenges in practice.

A literature review on the manner in which teachers respond to controversies reveals intriguing empirical findings: On the one hand, the results of the *International Citizenship and Civic Education Study (ICCS)* indicate that most of the 1,007 surveyed teachers from one federal state in Germany (North-Rhine Westphalia) for different civic education related subjects ascribe considerable importance to controversies: they support the fair treatment of differing viewpoints and emphasize the necessity of considering less respected positions (with some differences between schools). Consequently, they concur that multiperspectivity is crucial and that various perspectives should be acknowledged (e.g., Hahn-Laudenberg and Abs 2024). On the other hand, smaller studies simultaneously reveal a fundamental uncertainty regarding the handling of controversies in the classroom (e.g., Kindlinger and Hahn-Laudenberg 2023, Oberle 2023, Heil 2021). This uncertainty is particularly apparent when it comes to relating different positions to one another and understanding the role of one's own position in that context. Research indicates that teachers are often guided by a supposed "principle of neutrality" (e.g., Weselek and Wohnig 2021). According to this supposed principle, extremist positions (like the denial of anthropogenic climate change) are to be treated as equal to other viewpoints.

One reason often discussed for this anticipated neutrality is a misunderstanding of the Beutelsbach Consensus (*Beutelsbacher Konsens*, Wehling 1977). This guideline for political education emphasizes the prohibition of overwhelming students, the importance of presenting controversial topics in science and society as controversial issues in school, and the focus on students' action and engagement for their own political interests (for the development of the debate see Christensen and Grammes 2020). Empirical findings indicate that a lot of teachers perceive this guideline as a request to refrain from communicating their personal political views (Oberle et al. 2018). Additionally, many teachers believe that neutrality should be maintained in the classroom (Heil 2021). However, the notion of neutrality is posited to be neither realistic nor desirable. Instead, teachers should adopt a professional approach to managing controversies and reflecting their own orientations (Costa and Weselek 2023), which can become quite important in judging the absence of students due to the school strikes. Overall, it becomes evident that while teachers attribute significant importance to controversies, they are at the same time uncertain about what this means for translating different positions (including their own) into concrete practical actions.

In the international scientific discourse, different ways of dealing with controversies are described. Hess (2005) identified – based on an empirical study – four strategies of teachers in dealing with controversial issues: avoiding dispute, prioritizing certain perspectives, denying controversies, or balancing different positions, whereby a balanced approach is mostly described as desirable, if issues are assessed as controversial issues. Furthermore, different criteria are outlined to determine which topics

or positions should be taught in a controversial manner and which should not, that is, a behavioral criterion (which assumes that all positions discussed in public and in politics should also be discussed in a controversial manner in educational contexts), a political criterion (which assumes that positions should be discussed controversially if they are rooted in public discourse and manifest in electoral ballots, court cases, political programs, legislative debates, or as elements of political movements) and an epistemic criterion (which assumes that positions should be discussed controversially if they are rational and permit the articulation of opposing views without descending into inherent irrationality) (for a summary see, e.g., Drerup 2021, S. 54ff.). It is emphasized that it is essential to reflect explicitly on the underlying criteria, their rationale and consequences when dealing with controversial positions (e.g., Rucker 2021).

However, the issues addressed by FfF, especially with regard to effective climate policies, are often characterized by challenges where there is no clear right or wrong and different positions and solutions are legitimate and possible. The epistemic criterion provides a rationale for avoiding controversial discourse on the existence of anthropogenic climate change. In contrast, the adequate climate mitigation and adaptation policies remain characterized by a high degree of factual and ethical complexity. There are numerous interrelated factors, and a variety of ethical perspectives on the most appropriate and morally justifiable course of action (e.g., Mehren and Ulrich-Riedhammer 2021). Therefore, it is not only about presenting different positions in the sense of Hess' balanced approach, but also about dealing with the inherent complexity of these topics. Studies on how teachers deal with this complexity of global societal issues point to different strategies, ranging from simplifying complexity through clarity to increasing complexity by opening up various perspectives and relating them to each other (Taube 2023). Personal orientations and values seem to have an impact on the process of clarifying and/or balancing perspectives, in particular when it comes to authentic teaching (Bergmüller and Taube 2023). However, to date, there is still a significant gap in the literature with regard to the empirical investigation of the role of teacher values for specific teaching activities. For instance, the manner in which pedagogical actions are constructed upon personal values related to sustainability, and the ways in which different perspectives and conflicting goals are either considered or neglected, is worthy of examination. This leads to the question of how these actions of the teacher affect the students and to what extent the students feel empowered to cope with future challenges as a result.

School leaders

In contrast to the direct involvement of teachers in the classroom teaching process, school leaders are frequently engaged in administrative and school development activities, which are distinct from the teaching activities. This shift in focus gives rise to a distinct set of challenges. The specific challenge that school leaders face regarding FfF is that of achieving a balance between

constitutionally anchored principles, such as freedom of assembly, and the necessity of compulsory schooling (Graf 2020). Students participating in protests not only violate compulsory school attendance but also actively engage in a living democracy. Thus, the participation aligns with the goals of political and civic education in democratic societies but conflicts with the requirement for students to attend school. Moreover, school leaders' reactions are framed and restricted by laws (among others school law and "Dienstordnung" for school leaders in Germany) and the implicit rules of the system. School principals must take up and implement policy impulses of educational ministries that, in the context of Fff, were presented primarily as administrative actions, without referring to the pedagogical value of participation in public discourse. Thus, they must navigate within these systemic constraints and adhere to established guidelines. In this balancing process, the selection of interventions (e.g., forms of sanctions for participating in Fff) is often at the discretion of the individual school leader (Graf 2020), a situation which even more requires considered decisions. At the same time, school leaders act as role models and leaders for the entire teaching staff and play an important role in shaping the school culture, for example, by continuously developing the school profile.

In academic discourse, school leaders are seen as central to school organization, quality, and development (e.g., Huber 2016), particularly in the context of ESD (e.g., Grundmann 2017, Stricker et al. 2023). However, there is a lack of research on how school leaders deal with Fff. A representative study with 1,116 principals of all 16 federal states of Germany from 2021 reveals that 41% of them would in general (rather) accept the absence of engaged students (Fichtner et al. 2022, p. 59). The study also showed general openness to sustainability issues, which are central to Fff. The results of semi-standardized expert interviews with 46 school leaders from Germany, USA and China highlight that implementing ESD holistically, in a whole-institution approach, requires significant commitment from school leaders and alignment with their personal values (Stricker et al. 2023). While principals play a key role in implementing ESD in schools, the importance of the entire community of school members is also emphasized (ibid.). This is especially interesting because meta-analyses on school effectiveness (beyond ESD) show that school leadership is indeed a crucial factor for school effectiveness, though the mechanisms are complex (e.g., Bonsen 2016). Thus the actions of school leaders are not isolated decisions, but are influenced by school-related factors, such as the interests of the teachers or the socio-spatial context of the school, which in turn influence organizational factors. The specific type of school and the associated expectations regarding the role of school leadership are also significant factors in this regard.

1 Results on forms of participation, participants' motives and self-efficacy expectations have already been published (Costa and Wittmann 2021).

We would like to thank *Elena Wittmann*, who was part of the project team and involved in study conceptualization and data collection.

2 The lowest grade in the German school system.

3 German high-school degree.

Study: Perceived support from the students' perspective

While there are at least some empirical insights on attitudes, actions and roles of teachers and school leaders in the context of Fff, there is hardly any knowledge on the questions how students feel empowered by teachers and school leaders in their engagement in Fff. In protest and movement research, schools are often described as breeding grounds for Fff protests as they open up possibilities for mobilization and communication (Boscheinen and Bortfeldt 2021, Haunss and Sommer 2020). However, the extent to which students feel supported or inhibited by their school environment in participating in Fff has not yet been researched. For this reason, we will report the results of an exploratory study in Germany, which provides an initial, tentative insight into the students' perceptions of their teachers' and school leaders' reactions.

The study is based on an online survey conducted in March 2020 among Fff participants aged 16 and older.¹ The survey, distributed via mailing lists, social media, and flyers, yielded 194 responses from school students (50%), university students (27%), trainees (4%), professionals (12%), and others (8%) (all percentages rounded). This paper focuses on the 53 school students who answered open-ended questions about their teachers' and/or school principals' reactions to their Fff participation. These students had an average age of 17 years, with 65% being female and 78% attending high school.

The students were asked about the way in which their school leaders and their teachers reacted to their participation in Fff. The open-ended responses were analyzed using evaluative qualitative content analysis (Kuckartz 2016), resulting in a category system that classified reactions from rejection to support, including a "mixed response" category for ambivalent answers.

Students' perceptions of teachers' reactions

Firstly, a large proportion of students say that their teachers' degrees of consent or rejection vary depending on the teacher (29%). This is not surprising and suggests that responses depend on individual teachers' attitudes and preferences. As a result, many students face different reactions at school. To avoid multiple coding, we have grouped these responses into an extra category. Additionally, 24% of students say their teachers are positive about Fff participation, while 31% perceive their teachers even as supportive (e.g., "Teachers support us verbally and leave absences under the table"). A clear negative reaction with consequences (e.g., the threat of a grade 6² for absence) from teachers is reported by only 6% of students.

Students' perceptions of school leaders' reactions

In contrast, reactions from school leaders are more varied; 23% of students report rejection with consequences (e.g., serious threats: "If I miss too many days, I won't be allowed to take the Abitur³"), 20% noted rejection without consequences (e.g., "There is a general ban on participating in demonstrations, but



there are usually no consequences. Reason: they say we can do it in our free time”), 23% indicate a neutral reaction and 28% of the students observed supportive school leaders.

Perceived support from school leaders and teachers in relation to each other

In direct comparison, students more often report negative or neutral reactions from school leaders than from teachers (see figure 1). This difference is expected due to the distinct roles and responsibilities of school leaders and teachers. While teachers interact with students on a daily basis, school leaders have less contact and are often primarily visible in decision-making processes and/or the resolution of problematic situations.

To examine the potential links between teachers' and principals' reactions in greater detail, we also analysed the correlation between perceived reactions of the two groups (see table 1). For this purpose, we only distinguished between rejection, neutral and consent and did not include persons who gave a mixed response to at least one of the questions or who only answered one of the questions of interest. The remaining sample is $n = 33$.

The results indicate a correlation⁴ between the perceived reactions of teachers and school leaders. It is visible that when school leadership is regarded as neutral or supportive, teachers are more often perceived as neutral or supportive too. The other way around the tendency is even more apparent: teachers are perceived as rejecting only in cases where the school leader is also perceived as rejecting.

Discussion

We took the FfF protest as an occasion to explore the negotiation of controversial issues across various school levels (teachers, school leaders and students). While the distinct challenges that teachers and school leaders face when addressing topics raised by FfF are already discussed, the students' perspective on how they feel supported in participating in the school strikes and how the participation impacts their understanding of democracy have not been analyzed yet. The results of the presented exploratory study indicate that, from the students' perspective, teachers are generally perceived as more supportive of participation in FfF. In contrast, school leaders' reactions are often viewed as neutral or negative. Notably, when school leadership is perceived as neutral or supportive, teachers are also seen as neutral or supportive. In light of the theoretical and empirical insights, from the literature and our own study, three central aspects are discussed further.

Relations and mechanisms that shape educational organizations:

The results concerning the relationship between the answers of the teachers and the ones of the school leaders suggests that school leaders seem to play a crucial role in shaping the everyday actions of teachers and fostering a supportive learning environment for civic and political education. Given that teachers

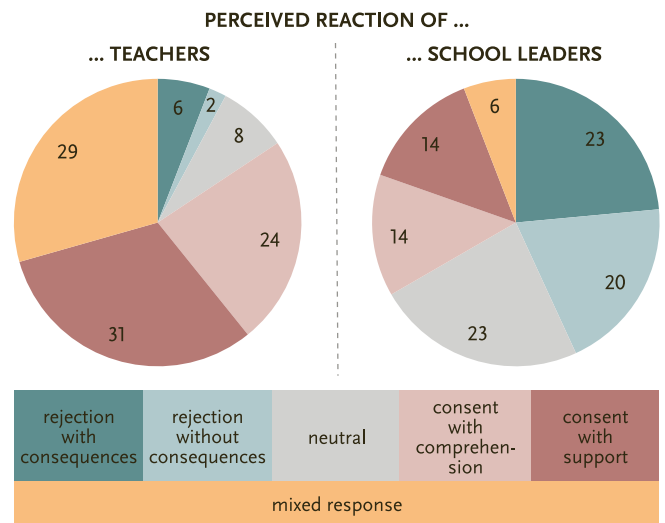


FIGURE 1: Perceived support from teachers and school leaders for participation in Fridays for Future based on open responses from an online survey conducted with school students in Germany in 2020. Questions: 1. How do your teachers and 2. how does your school leader react to your participation in the strikes? $n = 51$ for both questions.

often feel uncertain about how to approach controversial issues, the role of school leadership possibly becomes even more significant. By providing guidance and support, school leaders can assist teachers in navigating these challenging topics. For realizing this, school leaders also ask for more systemic support from educational policy (Holst et al. submitted). However, the relationship is more complex, as evidenced by findings related to school leadership. Actions of school leaders are also influenced by the composition of the community of school members, including teachers, students, and their parents. This complexity underscores the need for further investigation into the relations and mechanisms that shape educational institutions and their profiles. Such issues are also addressed in discourses surrounding the conceptualization of the “whole institution approach” (Holst 2023), which highlights the need for a comprehensive development of schools on different levels.

Necessity of comprehensive teacher training in dealing with controversial issues: The findings at the level of teachers in dealing with controversial topics indicate a notable degree of uncertainty with regard to the balancing of controversial positions. The situation is likely to become more challenging for teachers when they are faced with students expressing opposing views, which is a more probable scenario in classrooms with a diverse student population. In order to prevent discrepancies in the manner in

⁴ As it is an explorative study and a small sample (where, due to the low statistical power, p will be relatively high even in case of a clear effect), we decided to define a significance level of $p = 0.1$. We thus see a weak to moderate correlation between perceived rejection and perceived consent: $\chi^2 = 2.79$; $p = 0.095$; $\phi = 0.36$.

TABLE 1: Cross table of the perceived reactions from teachers and school leaders for participation in Fridays for Future based on open responses from an online survey conducted in 2020 (n=33, results are rounded). Questions: 1. How do your teachers and 2. how does your school leader react to your participation in the strikes?^a

		PERCEIVED REACTION TEACHERS [%]			
		REJECTION	NEUTRAL	CONSENT	TOTAL
PERCEIVED REACTION SCHOOL LEADERS [%]	REJECTION	27 100	7 33	67 39	100 46
	NEUTRAL	0 0	11 33	89 31	100 27
	CONSENT	0 0	11 33	89 31	100 27
	TOTAL	12 100	9 100	79 100	

a Reading example: In cases where teachers are perceived as rejecting, 100% of school leaders are also perceived as rejecting. Conversely, when the school leader is perceived as rejecting, 27% of the teachers are perceived as rejecting, 7% as neutral and 67% as consenting.

which controversial issues are addressed across different classes and types of educational institutions, it is essential that all teachers receive comprehensive training in dealing with conflicting perspectives in classroom situations, including training on how to handle challenging situations like the absence of students or the denial of anthropogenic climate change. It is of particular importance to enhance the professional self-concept of prospective educators, a fundamental precursor to incorporating controversial topics in teaching. However, the current status of political education in teacher training is heterogeneous, varying according to the teacher training programmes offered by different universities (e.g., Abs et al. 2024). Nevertheless, there are already encouraging initiatives aimed at enhancing prospective teachers' professionalism in dealing with controversies (e.g., Gronostay et al. 2024).

Using the tensions between educational goals and the objectives of the strikes productively: This article implicitly assumes that a professional and supportive approach of teachers and school leaders is desirable for fostering interested and motivated students. However, in the context of the school protests, the effectiveness of support remains uncertain and tensions between educational goals and the aims of the movement arise. The influence of a supportive or inhibiting school environment on young people is not yet clear. Pedagogizing the protest content can potentially defuse and invalidate the protest itself (e.g., Budde 2020) and it risks placing responsibility on young individuals and oversimplifying complex crises and societal issues. Therefore, it is important to note that not all support is equally beneficial, even within schools. Additionally, the media discourse shows tendencies to blame FfF students for unsustainable behavior on an individual level, thereby shifting the focus from climate policy de-

mands to individuals' responsibility, and diluting the political message of the protest. For this reason, it is essential that educators adopt a nuanced approach to the presentation of complex phenomena and different positions. Especially in the context of the increasing pressure on climate policy measures in connection with right-wing populist arguments, the limits of controversy themselves (e.g., when the epistemic criterion of science orientation is not met) are also becoming a subject of pedagogical debates and professionalization efforts (Drerup 2021).

Limitations of the study and future research

Our study can only provide a first tentative insight into the question of whether students feel supported by their teachers and school leaders when participating in school strikes. This is mainly due to the small sample size. To get a full picture of how students perceive support, it would be valuable to collect data based on a representative sample and with more specific questions. In our study the variance of the answers can hardly be captured, as we do not have questions about individual teachers, but about teachers at all. Therefore, it gives more of an overall impression, an approximation of the atmosphere in the school rather than depicting the actual reactions of the teachers. This must be taken into account in the interpretation and discussion of the results. For future research, studies could refer to specific teachers (e.g., in reference to different subjects). It would also be important to include the perspectives of teachers and school leaders themselves, in order to gain more information about their perceptions and felt tensions. In this context, it would be interesting to examine the students' in comparison with the teachers' perspective in order to learn more about potential differences between self-assessment and the assessment of others in dealing with social movements. Studies in this direction could also reveal insights on school culture and the particular atmosphere in relation to societal developments, as our results indicate a link between principals' and teachers' support and thereby hint to aspects of school atmosphere.

Furthermore, it must be taken into account that the reactions as well as the perception of reactions may evolve over time. The data presented here are based on a single survey conducted in March 2020. Consequently, any conclusions drawn from this survey must be interpreted with caution, as they represent a limited representation of the overall situation.

Conclusion

FfF prompts the question of what kind of education is necessary for the younger generation in order to effectively address current crises such as climate change and its far-reaching effects. We argue that schools can and should be learning environments in which students are encouraged to develop the competencies that will be relevant to make a difference in society and shape sustainability transformation processes. However, in order to achieve this, it is necessary to train teachers to become profession-



al and self-effective individuals who are able to introduce complex and controversial topics into the classroom without reducing perspectives to a single, one-sided viewpoint. Furthermore, it seems essential to provide school leaders with the skills to navigate and profile their schools in terms of sustainability. However, the responsibility for realizing sustainable development cannot be shifted to the school stakeholders. Rather, they are to be seen as a piece of a larger puzzle, where everyone can and should take part.

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Ethics approval: Informed consent was obtained from all participants of age prior to study enrolment. All participants could withdraw from the study at any time.

Data availability: The data supporting the results of this study are available on request.

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