Developing action competence for sustainability – Do school experiences in influencing society matter?

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ABSTRACT

In terms of developing students’ action competence when it comes to sustainability, the research literature highlights the importance of sustainability action taking in education for sustainable development. However, few studies have statistically investigated the relation between sustainability action taking and students’ action competence. Recognising the importance of action taking in education for sustainable development, this study investigates school experiences in influencing society as one important aspect of sustainability teaching and learning that promotes students’ action competence. We surveyed 902 students across three upper secondary schools situated within the same county municipality in Norway. One instrument measured the students’ school experiences in influencing society, and another assessed the students’ self-perceived action competence defined as i) knowledge of action possibilities, ii) confidence in one’s own influence, and ii) willingness to act. A structural equation model showed that school experiences in influencing society have a positive relation with all the action competence factors, supporting previous research that highlights the importance of taking action with regard to sustainability as a part of education for sustainable development. The findings indicate that providing students with opportunities to influence society can foster their development of action competence for sustainability.

1. Introduction

This article contributes to the field of education for sustainable development (ESD) by investigating what relation students’ school experience in influencing society might have with their self-perceived action competence for sustainability. ESD is becoming increasingly important as a response to the urgent societal and environmental problems the world is facing. The European Union (European Commission, 2022a;\textsuperscript{b}) and UNESCO (2020) suggest a comprehensive whole school approach (WSA) to ESD which can help schools to model, and promote ESD. With a WSA, this can be accomplished, not only through the schools’ curriculum and pedagogy, but also through using the physical and operational environment of the school as a meaningful learning-environment (Buckler and Creech, 2014; Goldman et al., 2018), interactions with the community (Gough, 2005; Scott, 2011), and through the governance priorities of educational institutions (Wals and Mathie, 2022). By implementing a WSA to sustainable development, schools can help students expand their knowledge and cognitive understanding of subjects, while using the local environment and community as an opportunity for practising this understanding (Gericke, 2022; Henderson and Tilbury, 2004; Holst, 2023; UNESCO, 2019).

The idea behind ESD is to empower and motivate students to take part in forming a sustainable future, and a WSA can support the teaching and learning associated with this aim (Rieckmann, 2017). One way for schools to facilitate teaching and learning with regard to sustainable development could be by including the students in actions aimed at transforming the school into a model of sustainability (Hargreaves, 2008; Henderson and Tilbury, 2004; Wals and Mathie, 2022). Jensen and Schnack (1997) argue that it is not how sustainable a school is regarding such aspects as waste management, electricity use or the cafeteria, which should be taken into account when assessing the success of ESD, but the educational objectives and student outcomes. It is essential to consider what students learn in terms of knowledge and competencies when participating in these activities (Jensen and Schnack, 1997). When evaluating schools “walking the talk”, it is important to assess more than simply how the students’ actions affect the school. The actions themselves are also a condition for effective learning (Shallcross and Robinson, 2008). Consequently, the research
literature stresses the importance of action taking, in which students acquire experience by engaging in concrete actions through the ESD teaching at their school to contribute to the solution of authentic local sustainability issues (Ohman and Ostman, 2019; Ojala, 2015b; Sinakou et al., 2019). Taking action to solve sustainability issues is considered to be a way of helping students develop action competence, which in turn can empower them to attempt to solve present and future problems (Chen and Liu, 2020; Varela-Losada et al., 2016).

1.1. Action competence for sustainability

The goal of ESD is often said to be to empower students to act with regard to sustainability now and in the future (Günthner et al., 2022; Jensen and Schnack, 1997; Rieckmann, 2017; UNESCO, 2020). However, knowledge about and attitudes with regard to something do not necessarily lead to actions (Kollmuss and Agyeman, 2002; Otto and Pensini, 2017). Sustainability issues are often extensive and complex, and can be geographically distant, disempowering people and hindering them from acting (Stoknes, 2014; van Zomeren, Pauls and Cohen-Chen, 2019). For this reason, Jensen and Schnack (1997) argue that education should provide students with insight into sustainability issues, but also give them the will, commitment and courage to make a change. An increasing number of researchers are therefore focusing on how students can develop their own action competence (e.g. Almers, 2013; Ellis and Weeke, 2008; Jensen and Schnack, 1997; Olsson et al., 2022; Sass et al., 2020).

Action competence has been described as both an educational approach (Ellis and Weeke, 2008; Jensen and Schnack, 1997; Schnack, 2003) and a latent competency to deal with goals such as improved health or sustainability (Chawla and Cushing, 2007; Sass et al., 2020). In this study, we look at action competence as a competence defined as being composed of three sub-constructs; 1) knowledge of action possibilities, 2) confidence in one’s own influence, and 3) willingness to act (Breiting and Mogensen, 1999; Sass et al., 2020). ESD has previously been critiqued for being normative, seeking to enhance students’ willingness to act in specific ways (Jickling and Wals, 2008). As willingness is one of the factors included in action competence as used in this investigation, some might argue the same is true for ESD, in terms of aiming to help students develop action competence. However, willingness to act in relation to sustainability issues is a broad concept, including social, environmental, and economic issues in the private and public sphere, and small and large actions. One could expect that most students would like to contribute to making the world a better place if they think they are capable of so doing, although what, how much and in what way might vary. Thus, the willingness aspect of action competence as defined by Sass et al. (2020) does not prescribe specific actions and does not seek to indoctrinate, but rather to empower, helping students to figure out where and how they want to contribute to sustainable development. The question is, then, how can education help students develop their action competence?

Research shows that several factors might contribute to the individual’s development of action competence. These factors include both pluralistic and holistic teaching (Olsson et al., 2022); trust and faith from adults (Almers, 2013); emotions, values and having action-oriented role models (Almers, 2013); and participation in decision-making at school (Cincera and Krajhanzl, 2013; Torsdottir et al., 2024). One paper by Verhelst et al. (2022) has also highlighted the importance of the school organisation in terms of action competence. They found that sustainable leadership, democratic decision-making, and pluralistic communication, are critical elements in the development of action competence on an individual level. Overall, both external and internal factors influence action competence. One aspect suggested as being important in developing action competence is action taken with regard to sustainability, in which students can practice influencing society (Sinakou et al., 2019; Varela-Losada et al., 2016). Nevertheless, studies on action competence in relation to students taking actions towards solving sustainability issues are limited (Sinakou, Donche and Van Petegem, 2022).

1.2. Taking action through ESD and students’ experiences in influencing society

According to the literature, students cannot simply learn about sustainable development. They also need to experience taking part in concrete and authentic actions relating to sustainability (Fielding, 2001; Jensen and Schnack, 1997; Sinakou et al., 2019). A participatory approach to ESD where students get to practice taking action in relation to sustainability is often seen as a central element in a WSA to sustainable development (Cincera et al., 2019; Hargreaves, 2008; Shallcross and Robinson, 2008; Wals and Mathie, 2022). By improving students’ own school environments and that of their local communities, the WSA aims to enhance students’ learning about societal needs (Mogren, Gercke and Scherp, 2019). Consequently, Sinakou et al. (2019) argue that action is a central part of ESD.

Sinakou et al. (2019) developed an action-oriented ESD framework for creating powerful learning environments. In this framework, action taking, in which students get to take actions for sustainability, is seen as vital for ESD. These actions can be direct, in which students try to affect the root of the problem, or indirect, in which students try to convey or influence others to take action. Actions can also be taken in the private or public sphere, and both individually or collectively. Sinakou et al. (2019) argue that students should have an active role and be responsible for decision-making regarding these actions. By letting students experience democratic decision-making with regard to sustainability issues, schools can prepare them for continuous and active participation as citizens (Goldman et al., 2017; Levy and Zint, 2013; Schank and Rieckmann, 2019; Sund, 2022).

In the face of difficulties, people have little motivation to act if they do not believe they can perform a particular task or that such an action will not yield the desired result (Almers, 2013; Bandura, 1997, 2000; Ovais, 2023; Sass et al., 2020; Goldman et al., 2020). Thus, the experience of participating and having an impact at school and in society can help students develop their action competence and provide hope for the future (Chen and Liu, 2020; Martiskainen et al., 2020; Sass et al., 2020). This idea was supported by Torsdottir et al. (2024), who found that student participation and influence can be important for developing action competence. However, their research investigated student participation as a way of having an influence within the school setting, rather than how students’ school experiences in participating in society can help them to develop their action competence. According to Sinakou et al. (2019), actions in the local community are an important aspect of ESD.

Action taking and community involvement are considered important components of an ESD in terms of letting students deal with sustainability issues, and being effective in cultivating students’ action competence (Barratt Hacking, Scott and Barratt, 2007; Lawson et al., 2018; Sinakou et al., 2019; Varela-Losada et al., 2016). For students to become active participants, they must learn how to participate in a good manner as well as experience participation (Freire, 1999; Hodson, 2014). Teachers can play a crucial role in helping students grasp opportunities to influence local, national and international decision-making about sustainability matters (Hodson, 2014). To do this, Hodson (2014) argues that students need to take responsibility in activities where they seek to make a difference together. Working in and with the local community can provide opportunities for authentic learning experiences and a holistic approach to ESD (Barratt Hacking, Scott and Barratt, 2007; Chawla and Cushing, 2007; Korsager and Scheib, 2019; UNESCO, 2019). By engaging students in the process of specifying what sustainability means to them locally, participatory approaches can help increase student engagement with regard to sustainability (Fischer, 2012). Education that facilitates action taking can help learners contribute to solving problems in a way that is meaningful for them.
While looking at what can make individuals or groups act with regard to sustainability, this does not absolve the state or institutions from their responsibilities (Alsop and Benze, 2014). Focusing solely on individual causes of sustainability can produce a narrow and simplistic picture that overlooks the complexity of problems (Schindel Dimick, 2015). Direct and private actions, such as using bicycles instead of driving, recycling or reducing water use, are important, but focusing on these types of actions in ESD might shift the responsibility from the state to the individual (Schindel Dimick, 2015). Individual lifestyles are essential for promoting sustainability, but focusing primarily on individual responsibilities may limit students’ understanding of the underlying causes of sustainability issues (Schindel Dimick, 2015; Voulvoulis et al., 2022; Westheimer and Kahne, 2004). Furthermore, it may limit students’ capacity to envision innovative solutions and challenge the existing systems and structures that are part of the problem (Westheimer and Kahne, 2004). Instead, Schindel Dimick (2015) argues that ESD should help students identify actors responsible for sustainability issues, hold them responsible for their policies and practices, and demand that they change them for the common good. Designing learning situations in which students can experience influencing society in different ways can be one way in which schools encourage this sense of responsibility. This is in line with Hodson (2014), who argues that traditional barriers between society and schools should be dissolved to improve the chances to see and take opportunities to influence. An education that gives students experiences with regard to influencing society, and helps them develop the skills needed to address underlying systemic and structural issues, can help avoid placing an unreasonable burden on individuals (Schank and Rieckmann, 2019). Systemic and individual change can also affect each other, and by letting students engage in indirect actions to solve a problem, it allows them to get to the root of the problem and perhaps change the system (Chawla and Cushing, 2007; Hodson, 2014).

Research shows that teaching practices play a crucial role in cultivating students’ action competence (Olsson et al., 2022; Sass et al., 2022). One of the teaching practices that are believed to be important for students’ development of action competence is allowing them to take action with regard to solving sustainability issues (Jensen and Schnack, 1997; Sinakou et al., 2019; Varela-Losada et al., 2016). However, teaching oriented towards taking action, which encourages students to engage in sustainability actions, is underexplored (Sinakou, Donche and Rieckmann, 2019). For this reason, several researchers have called for more empirical research on teaching practices in ESD, focusing on students taking action towards sustainability (Olsson et al., 2022; Sinakou et al., 2022). One such type of teaching practice can be letting students gain experience in terms of influencing society. For small children this can be about engaging in actions in their school, schoolyard, or local community, but as they age they can be encouraged to take a more active role in society (Chawla and Cushing, 2007). Chawla and Cushing (2007) argue that teaching is not only about how to teach young people to act favourably towards the environment, but also how to teach them to do so effectively and strategically. Strategic actions can press businesses or municipality departments to become more environmentally-friendly, and can have a much larger effect than an individual can contribute through private actions (Chawla and Cushing, 2007). Due to the benefits of strategic actions, this study will focus on one aspect of action taking, namely school experiences in influencing society and its relation with students’ self-perceived action competence.

1.3. Purpose and research question

The literature suggests that taking actions with regard to sustainability facilitates the development of action competence (Sinakou et al., 2019; Varela-Losada et al., 2016). However, there is limited empirical research investigating how students’ school experiences in terms of taking action in society could influence their action competence (e.g. Olsson et al., 2022). Given the importance of action competence as an outcome of ESD, this study aims to contribute knowledge in relation to this research gap by using two questionnaire instruments. One measuring students’ experiences in influencing society, was developed for this research. The other was created by Olsson et al. (2020) to measure students’ self-perceived action competence for sustainability (SPACS-Q) as defined by Sass et al. (2020).

The research question is:

What is the relationship between students’ school experiences in influencing society and their self-perceived action competence for sustainability?

2. Methods

This study uses a quantitative research design to answer the research question. In the following section, we describe the context of the investigation, the measures used, the data collection process, and how we performed the analysis.

2.1. The context of the study

The study is part of a broader project called ESD in Practice, which started in 2017 at the [University]. The project involves collaboration between the teacher education department at [University], a county municipality, and four upper secondary schools using the WSA as a framework for developing a holistic practice with regard to ESD. As well as developing school practice, the project also investigates how ESD can be integrated into teacher education to help equip future teachers with the skills needed to foster sustainable development. The partnership is long-term, allowing ideas and experiences to mature over time. As part of the project, all the schools involved have received funding to release one teacher for one day per week to coordinate the project, and act as a link between the university and the schools’ teachers. The coordinators, school principals, and representatives from the county municipality and [University] meet regularly to discuss the project’s progress and plans. The schools have a great deal of autonomy as to their participation in the project, and the extent and manner of implementation is largely up to the individual school.

Part of the project includes theoretical courses on ESD, and on working interdisciplinarily, seminars, and study trips for teachers. The schools have also held several sustainability-oriented activities tailored to each institution’s needs and interests. These initiatives include launching exploratory classes where students have a number of dedicated weeks for interdisciplinary projects during which they investigate sustainability issues. These project weeks involve students tracking the lifecycle of a product, leading up to them contacting the manufacturers in an attempt to influence the company concerned to improve one part of the product chain. Two schools have been enhancing their food offerings in the school canteen with increased plant-based options. They are developing school gardens, and one school is establishing a composting system. The schools also work with the local community, for example by trying to improve the well-being of the elderly in a local nursing home, or by harvesting unused fruits from local gardens, for jam and lemonade production. Students have also taken initiatives in the form of their own projects, such as running bike repair and clothing swap days.

In Norway, ESD has traditionally lacked a unified national system or guidelines, resulting in sustainability education often being limited to natural science subjects (Strøme, 2016). However, in 2020, a new curriculum was implemented in Norway. In this curriculum, sustainable development was one of three interdisciplinary topics focusing on societal challenges that need effort and commitment on the part of communities and individuals. The curriculum also highlights that schools should seek to promote skills often mentioned as learning objectives in ESD, such as critical thinking, ethical awareness, in-depth learning, and collaboration skills. Thus, while Norwegian schools and teachers have a
high level of autonomy, the new curriculum provides a supportive frame for schools focusing on ESD, and ensures that all schools work in an interdisciplinary manner on sustainable development.

2.2. Participants

Due to the Covid-19 pandemic, only three out of the four schools in ESD in Practice participated in the study. The schools are of varying size and type of study programme. The largest school has approximately 1400 students, the second-largest one has approximately 700 students and the smallest has approximately 530. While the smallest school emphasises general study programmes, and the second-largest one places an emphasis on vocational study programmes, the largest offers both general and vocational study programmes to its students. Although all students were supposed to be invited to participate in the study with their class, the Covid-19 pandemic made it difficult for most classes to participate, resulting in 902 students between 15 and 24 years of age (M = 16.8 years, SD = 1.3) participating in the study. The grade and gender of the participants can be seen in Table 1. Almost all students in the classes participated by filling in the questionnaire. We do not have access to the number of students in each class, but the students who did not take part in the study were mainly at home due to illness, taking an exam, or participating in other activities in their school at the time of the data collection. Very few students who were present in the classroom declined to participate, which means that nearly 100 % of the students present at the time of the data collection participated.

The study was registered with the [Organisation]. It was conducted in accordance with the ethical standards of [Organisation].

2.3. Measures

We used two scales in the study. The first was developed for the current study and consisted of four items tapping into different ways of influencing society (see items 1–4 in Table 2). While all four items in the scale related to acquiring experience in influencing society, they each looked at different aspects, from influencing decisions in their local environment, to experiencing how their actions connect to global issues. At the initial stage of development, specialists in the area of ESD discussed the items as the first stage of the validation process. The questionnaire was then presented to 187 students in a pilot run. After completing the questionnaire the students had group discussions with the main author to see if the items were clear and understandable to the face validity of the scale (Hardesty and Bearden, 2004). As a result of these processes, the language was improved, and there were a few additional questions. The items had the following explanatory text to help the students interpret the questions:

Below you will find questions about how you work at school to influence society. You can influence locally, nationally or internationally. For example, influence can occur through responding to hearings, contacting politicians or organisations by email, social media, or by submitting reader posts. There is no right or wrong answer, we want to know how you experience it.

Olsson et al. (2020) developed the other scale used in the study to capture the three main elements of action competence as defined by Sass et al. (2020) through a self-reported survey. The self-perceived action competence for sustainability questionnaire (SPACS-Q) contains 12 items. Four items relate to students self-perceived knowledge of action possibilities, four to their confidence in one’s own influence, and four to their willingness to act (see items 5–16 in Table 2).

Both instruments were administered using a five-point Likert scale ranging from “completely agree” to “completely disagree.” As we considered the items as something all students could have an opinion on, we did not include a “Do not know” option. Thus, the participants had to answer the questions based on their experience in relation to the statement in each of the items. We informed the students that there were no right or wrong answers, since we were interested in their experiences.

2.4. Collecting and analysing data

The data collection took place during school hours from October to December 2021 using an online questionnaire. A class representative or teacher presented the questionnaire in a standardised manner after receiving instructions on how to do so, ensuring that all participants received the same information. Before completing the questionnaire, all participants were informed that participation was voluntary and about the study’s purpose. The study’s purpose and the participants’ rights were also on the first page of the questionnaire, and participants had to
To analyse the data, we first imported it to IBM SPSS Statistics version 27 to calculate descriptive statistics for the entire dataset. We then used exploratory factor analysis (EFA) to investigate the factor structure of the items regarding students’ experiences in influencing society, since this was a new scale. The principal axis factoring was used to perform the EFA. Because the Kaiser criterion (keeping factors with eigenvalues above one) by itself is not particularly accurate, we also performed a scree test (Costello and Osborne, 2005).

We then conducted a confirmatory factor analysis (CFA) with regard to the items from the self-perceived action competence model, before performing structural equation modelling (SEM) to investigate the relationship between our two models. The CFA and SEM analyses were completed in Mplus 8 using a robust maximum likelihood (MLR) estimator. As the students had to answer all the questions in order to submit the questionnaire, there were no missing data. We evaluated the CFA and SEM analyses using chi-square values and four goodness of fit indicators using Hu and Bentler’s (1999) cut-off values, namely the root mean square error of approximation (RMSEA) < 0.06, a comparative fit index (CFI) > 0.95, and the standardised root mean square residual (SRMR) < 0.08. To examine the scales’ internal consistency, we calculated Cronbach’s alpha using SPSS. A coefficient greater than 0.7 was considered satisfactory (Mehmetoglu and Jakobsen, 2016).

3. Results

In the results section we first present an EFA to see if the items in the first instrument relating to students’ experiences in influencing society is one factor. We then present a CFA of the second instrument, the SPACS-Q, before presenting descriptive statistics for both instruments. Lastly, to answer the research question, we present a SEM analysis to investigate the effect of school experiences in influencing society on students self-perceived action competence.

3.1. Exploratory factor analysis – School experiences in influencing society

To investigate the school experiences in influencing society items, we performed an EFA. The scree plot and eigenvalue rule matched, leaving us with one factor. Because only one factor occurred in the EFA, no rotation was performed. For an item to be included in a factor, its standardised loadings exceeded or equalled 0.6 (see Fig. 1).

3.2. Confirmatory factor analysis – Self-perceived action competence for sustainability

Despite the significance of the chi-square ($\chi^2 (183, N = 902) = 586.516, p < 0.001$), this analysis involved quite a large sample, so the other four goodness of fit estimates should be examined (Kline, 2016). According to the CFA, the self-perceived action competence model has a good model fit: $\chi^2 (51, N = 902) = 190.514, p < 0.001$, RMSEA = 0.055, CFI = 0.965, TLI = 0.955, and SRMR = 0.034. In all latent factors, the standardised loadings exceeded or equalled 0.6 (see Fig. 1).

3.3. Descriptive statistics

To illustrate how the participants responded, the students’ Likert scale answers are presented in Table 4 as a percentage distribution, together with the mean and standard deviation for each factor and item. We have chosen to report on the three years combined, as the results do not differ much between years, and as we are not looking to evaluate the programme in different year groups. The students used the entire scale. We computed Cronbach’s $\alpha$ for the factors and the $\alpha$-values suggest good instrument reliability.

3.4. Structural equation modelling

We used an SEM model to investigate the effect of school experiences in influencing society on students’ self-perceived action competence. The analysis showed a good level of fit with $\chi^2 (98, N = 902) = 306.615, p < 0.001$, RMSEA = 0.049 [0.042, 0.055], SRMR = 0.045, CFI = 0.963, and TLI = 0.955. Fig. 1 shows the standardised regression coefficients from school experiences in influencing society to the three action competence factors. In Fig. 1 we present the standardised regression coefficients indicating significant paths between school experiences in influencing society on the three constructs of action competence. The figure illustrates that an increase of one standard deviation in school experiences in influencing society leads to an increase of 40 %, 34 % and 19 % of a standard deviation in the three different elements of students’ self-perceived action competence. The results therefore indicate a medium positive effect on knowledge of action possibilities, and confidence in one’s own influence, as well as a small but significant effect on students’ willingness to act (Fig. 2).

Table 3

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<th>Factor loadings from the EFA for the items on school experiences in influencing society.</th>
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Fig. 1. CFA with factor loadings for the self-perceived action competence for sustainability model.
4. Discussion

Our results indicate that school experiences in influencing society have a positive relation with students’ self-perceived action competence for sustainability. Given the sustainability challenges the world is facing, several researchers have highlighted the need for an education that allows students to gain experience in addressing sustainability challenges in their local communities (Chen and Liu, 2020; Öhman and Östman, 2019; Ojala, 2015a; Sinakou et al., 2019; Varela-Losada et al., 2016; Wals and Mathie, 2022). Taking action with regard to sustainability as a part of ESD can be understood in many ways, and can contain many different forms of action. However, this study focuses on students’ opportunities to influence society through their education. Influencing society is one important aspect of taking action. Chawla and Cushing (2007) argue that this can teach students effective ways of making changes, and can help them see that they can have an impact greater than their daily actions done in private.

4.1. The relation between students’ experiences in influencing society and students self-perceived action competence

According to our results, students’ self-perceived action competence for sustainability is positively influenced by their school experiences in influencing society. Our results complement the picture and argumentation outlined by Olsson et al. (2022), who suggested that future research could investigate the relationship between students’ experiences of influencing through action-oriented teaching, and their action competence for sustainability. While this study cannot say anything about the causality of this relation, the results are consistent with previous works that highlight the important role of action taking as part of ESD, and the development of action competence (Chen and Liu, 2020; Sass et al., 2020; Sinakou et al., 2019; Varela-Losada et al., 2016; Wals and Mathie, 2022). First, our findings provide empirical support for the action-oriented ESD framework created by Sinakou et al. (2019). In their framework, community involvement and action taking with regard to concrete, relevant societal challenges were highlighted as essential for creating learning environments that facilitate the development of action competence. Additionally, our findings resonate with the literature reviews conducted by Varela-Losada et al. (2016) and Chen and Liu (2020), both of which underscore the value of action taking and working with society for empowering students and nurturing action competence. While several studies have previously posted similar views, most of them are qualitative or theoretical studies (for a review, see Chen and Liu, 2020). Consequently, our work adds a quantitative dimension to this body of knowledge.
Varela-Losada et al. (2016) assert that involving society in educational activities can enable students to become agents of change, and apply their classroom knowledge to real-life situations. This approach facilitates first-hand experience with local issues, providing insight into how competing interests impact decision-making (Hodson, 2014). Through activities that seek to influence society, students can gain experiences and ideas, learn about socio-political structures and gain access to people and institutions (Hodson, 2014). Participating in these activities can help build their commitment and the individual and collective capacity to tackle sustainability issues respectfully, critically and responsibly (Hodson, 2014).

Although the analysis showed a positive relation between students’ experiences in influencing society and all action competency factors, the results show a stronger relation between students’ knowledge of action possibilities and confidence in one’s own influence, compared to their willingness to act. This aligns with previous research looking at the effect of different aspects of ESD on action competence (Goldman et al., 2018). We have no straightforward explanation for this finding. However, it might be that the students do not feel it is their responsibility to act, and that it is more difficult to develop students’ engagement than their knowledge and confidence (Korsager and Scheie, 2019). Willingness to act is an important aspect of action competence because intentions are a strong predictor of taking action (Ramberg and Möser, 2007; Goldman et al., 2017). The students in our study report limited school experiences in terms of influencing society. Enhancing opportunities to influence sustainability issues in society, might potentially boost their understanding that their actions matter, which in turn might strengthen their willingness to take action even more. Nevertheless, confirming this hypothesis would require a more detailed investigation such as a comparative study using a pre- and post-test approach.

In our study, we emphasise the importance of broadening student participation in a WSA beyond the school setting, as discussed by Torsdottir et al. (2023) and Torsdottir et al. (2024). The positive relation between school experiences in influencing society and students’ self-perceived action competence underscores the significance of allowing students to participate in, and work towards influencing a broader society for the better. The results suggest that by having an education that facilitates student experiences in influencing the local and the wider community, by trying to influence businesses to work more ethically, and seeing how this influences global sustainability issues, ESD can support students in developing action competence. We do not assume this to be an easy task for teachers, and they need practice and support from the structures and routines of the school (Mogren, Gericke and Scherp, 2019; Sund, 2022). This might be part of the reason why the students report that, to a large extent, this type of education does not happen in the participating schools.

### 4.2. Students have few school experiences in influencing society

Although the schools in this study work towards a WSA to sustainable development, and Rieckmann (2017) argues that a WSA facilitates action taking, few of the students in the study agree or even partly agree that they get to influence society through the teaching in school. Part of the reason for this might be due to the data being collected during the Covid-19 pandemic. However, the results are also in line with previous research conducted on the schools in ESD in Practice prior to the pandemic (Bjønness and Sinnes, 2019). When interviewing different stakeholders at the schools, Bjønness and Sinnes (2019) found that the theoretical focus on sustainable development had been disconnected from the action perspective, which they argued could make it difficult for students to develop action competence. In Belgium, Sinakou, Donche and Van Petegem (2022) found that despite teachers having an interest in action-oriented teaching, they rarely used it in practice. Boeve-de Pauw et al. (2022) investigated Swedish schools working to implement a WSA to sustainable development and found that the teachers in their study reported little collaboration with societal actors such as businesses and local government agencies, and with using the local environment in their teaching of ESD. According to Boeve-de Pauw et al. (2022), it might help if the professional development of teachers emphasises practices that facilitates action taking with regard to sustainability. Other aspects that might make this work difficult might be conflicts between school practices that promote high achievement instead of transformative vision and goals that are important in ESD (Barratt Hacking, Scott and Barratt, 2007). While engaging students in influencing societal issues can be challenging, the positive relation in our SEM-analysis indicates that schools that achieve it can contribute to fostering students’ development of their action competence.

### 4.3. Limitations and future research

This study has certain limitations that should be acknowledged. Firstly, the data was collected during the Covid-19 pandemic, which prevented one of the schools and several classes from participating as planned. Thus, the study was conducted with participants from three schools in the same county municipality in Norway. It could therefore be interesting to conduct a similar study in additional parts of Norway, and also to investigate possible differences between countries. Furthermore, the pandemic impacted how students could participate in school (see Torsdottir et al., 2023), and the restrictions due to the pandemic probably affected how much they could interact with the surrounding society. During the pandemic, students’ self-perceptions of action competence may also have been affected by lockdowns and insecurities. To mitigate this, an investigation conducted in a more typical school year could provide valuable insights. Secondly, the study design does not allow for causal conclusions. A comparative study with pre- and post-tests could be conducted to investigate the causal effect of influencing society on students’ self-perceived action competence. Additionally, given the various internal and external factors mentioned in the introduction that influence action competence, further research exploring the effect of school experiences in influencing society, in conjunction with other significant variables, is warranted. Despite their inherent challenges, longitudinal studies could offer vital insights, particularly since the development of action competence is a gradual process (Olsson et al., 2022).

Questionnaires are effective for gathering information from a large number of participants and for obtaining data about unobservable data such as self-perceived action competence for sustainability. However, self-reported data has several limitations (Kormos and Gifford, 2014). Determining actual opportunities and experiences, and how much these are based on students’ motivation, self-efficacy, and competence, is challenging. While Kormos and Gifford (2014) argue that questionnaires are still essential in ESD research, future studies should consider including alternative methods such as observation and interviews to better understand the statistical results and the dynamics at play in educational settings.

Another limitation of our study is the lack of information about the specific activities or how they were carried out. Even though we know some of the schools’ activities, we do not know all, or which respondents carried out which activities. School experiences in influencing society were the only type of action taking investigated in the study. Steps taken to influence others are indirect actions which, according to Chawla and Cushing (2007), are more effective than direct actions, but the latter are also important (Hodson, 2014; Jensen and Schnack, 1997; Sass et al., 2020; Sinakou et al., 2019). In addition, it is argued that student involvement as early as possible is crucial in determining what actions to perform (Hodson, 2014). However, in the current study, we cannot know if students or teachers initiated the actions, or if the students were invited to participate by other stakeholders such as local politicians. It would also be interesting to discover whether the students performed collective or individual actions. According to Lesy and Zint (2013), collective action is needed to address large-scale sustainability issues, and collective action gives students the advantage of learning and
benefiting from one another. It would also be valuable to know if the students reflected upon their actions, as it is important to evaluate their strategies, processes, and the outcomes of actions, in order to gain a deeper understanding of how that action affected or did not influence the issue at hand (Hudson, 2014; Jensen and Schnack, 1997; Olsson et al., 2020; Sinakou et al., 2019). Thus, it would be interesting in future studies to explore different types of opportunities the students might have had in terms of influencing society, and how the processes were performed.

Lastly, our study and previous studies have found that students do not get many opportunities to influence society through school (Bjønness and Sinnes, 2019; Olsson et al., 2022; Sinakou et al., 2022). Therefore, future studies could investigate what hinders and helps teachers to do this type of work with their students, and how teachers and students can be supported in this work.

5. Conclusion

In conclusion, this study contributes to the field of ESD by highlighting the importance of school experiences in influencing society in developing students’ action competence for sustainability. Our results show that school experiences play a significant role in this respect. The positive correlation in our SEM-analysis indicates that experiences of influencing society contribute to increased self-perceived knowledge about sustainability issues, and to empowering students by increasing their willingness to act, and to develop the confidence that their actions matter. More research is needed to explore how schools can best provide teachers with the training and structural support they need to provide meaningful sustainability actions as part of their teaching.

Given the specific participant group and the local context of our study, we cannot claim that our results are transferable to all schools. While our study contributes valuable insight into ESD, we emphasise the need for more research on this topic. Including different types of schools in different countries is needed to generalise the results in an international context. Such a study should preferably include mixed research methods to provide a deeper understanding of the results. Nevertheless, the results support the view that schools could facilitate the development of student competencies for taking action by adopting an approach to ESD that provides opportunities to influence, not only the situation within schools, but also to address broader sustainability issues in society. In this way there can be an interplay between schools and local, national, and global contexts in shaping both education and sustainable development. Such an approach could therefore help young people develop action competence. As a result of school experiences in influencing society, students might be more likely to take action and actively contribute to a just, peaceful, and sustainable society.

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CRediT authorship contribution statement

Ane Eir Torsdottir: Software, Project administration, Methodology, Conceptualization, Data curation, Formal analysis, Investigation, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. Daniel Olsson: Conceptualization, Formal analysis, Investigation, Methodology, Supervision, Validation, Writing – review & editing. Astrid Tonette Sinnes: Conceptualization, Investigation, Methodology, Supervision, Validation, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The authors do not have permission to share data.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.gloenvcha.2024.102840.

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