Spaces of learning – practising the SDGs through geographical fieldwork methods in a nature park

Thomas Skou Grindsted and Thomas Theis Nielsen
Department of People and Technology, Roskilde University, Roskilde, Denmark

Received 1 April 2021
Revised 11 August 2021
1 October 2021
Accepted 3 October 2021

Abstract

Purpose – While the sustainable development goals (SDGs) and visions for sustainability education apply to many methods, they can be hard to put into practice. This study aims to concern an undergraduate geography course designed not only to teach geographical methods but also to engage with the multi-scalar nature of the SDGs and apply them to various local urban sustainability issues in a real-world context.

Design/methodology/approach – By means of a mixed-method approach, the authors examine a fieldwork course that invites students into learning situations in which they combine critical thinking with entrepreneurial solutions to local sustainability challenges. The authors examine the learning material from the students' cases and explore the geographical knowledge the students' practise.

Findings – Fieldwork helps students contextualise the multi-scalar nature of the SDGs and thereby apply them to analyses in a local context. Students learn first-hand how their planning proposals can be seen as counterproductive by some local stakeholders while remaining attractive to others.

Originality/value – Student tasks are developed in collaboration with a local municipality and students present their findings to local politicians and stakeholders. Presenting and localising the SDGs within a local community not only encourages students to undertake a local community analysis but also provides new perspectives to local stakeholders.

Keywords Sustainable development goals, Education for sustainability, Nature park, Geography education, Fieldwork, Real-world programmes, Fieldwork methods

Paper type Research paper

1. Introduction – rescaling the sustainable development goals

As humans interact with the physical environment to the extent that humanity transforms the planet from one geological epoch, the Holocene, towards the Anthropocene (Steffen *et al.*, 2011), it is widely acknowledged that geographical imaginations are vital to make sense of sustainability challenges (Demirci *et al.*, 2018). The multi-scalar nature inherent to many

The authors wish to acknowledge the local comunity in and around the nature park of Åmosen for their patience and contributions to this work. Authors are highly appreciative of the engagement of the many active roles played by the community. Also authors wish to thank the Nordea Foundation supporting the New Roads in Åmosen Nature Park, a research and development project.

International Journal of Sustainability in Higher Education
Vol. 23 No. 8, 2022
pp. 105-119
Emerald Publishing Limited
1467-6370
DOI 10.1108/IJSHE-04-2021-0132

sustainability challenges, spanning global and localised phenomena, equally applies in the context of the sustainable development goals (SDGs) (Liverman, 2018; Salvia *et al.*, 2019). Teaching the SDGs, therefore, encapsulates both multi-scalar dynamics and methodological approaches to study human-environment interactions. This enables students to better understand the complexities of sustainability goals and, in turn, develop more holistic approaches (Nightingale, 2018; Meadows, 2020; Yli-Panula *et al.*, 2020). As Grindsted (2015, p. 320) noted, the journey of geographical transformations is also a journey of the nature of time and space. Consequently, geographical analyses address sustainability challenges, their dynamics, contextualities and consequences across scales, as a means to understand and inform planning debates over practical solutions and their implementation (Meadows, 2020). Even though we live in a world where more than half the planet's land surface has been changed by human activities (Steffen *et al.*, 2011; Castree, 2015), geographers have been slow in integrating sustainability into curricula (Yarnal and Neff, 2004; Chalkley, 2006; Westaway, 2009; Grindsted, 2015). Yet, core concepts in geography education are space, place, landscape, people, nature and sustainability (Mansfield, 2009; Grindsted, 2018). While Nightingale (2018) and Liverman (2018) point towards profound contributions to the study of SDGs, they also find dilemmas and ambivalences, not least the multifaceted nature of avoiding complex, fuzzy, slippery concepts. To the extent that grand narratives such as the SDGs are problematic, their multiple nature combines global and local dynamics and their interactions and effects on different scales. Much like previous debates involving local-global dynamics, as in the case of McLuhan's (1966) global village, Swyngedouw's (1997) glocalization or similar global-local discourses (Massey, 2005), SDGs advocate for sustainable conceptions (Liverman, 2018; Salvia *et al.*, 2019) that are commensurable with interchanges between the global and the local. Such conceptual revolutions in understanding multi-scalar socio-environmental processes in time and space are not without their contradictions. As daily commuting by an individual barely impacts global environmental change, glocalization of the SDGs at a systemic level prevails (Demirci *et al.*, 2018; Meadows, 2020). Hulme (2008) points to modes of thinking about sustainability across scales. As different disciplines operate on quite different Spatio-temporal scales, translation between culturally embodied Spatio-temporal organizations of socio-ecological processes is crucial if we are to achieve "more" sustainable skills. Consequently, a solution on one scale may produce sustainability challenges on another, hence, contradictions, dilemmas and ambivalences come into play (Grindsted, 2015; Liverman, 2018; Nightingale, 2018). Thus, they invite scholars to address contradictions, ambivalences and paradoxes inherent in different SDG agendas and thereby enable students to better respond to them. Yet, research on how to put SDGs into practice with geographical methods is limited, even though the role of geography and geographical methods are particularly relevant. Rather than concepts, geographical methods take space and place as entry points in addressing sustainability challenges across scales (Grindsted, 2015; Widener *et al.*, 2016).

1.1 Regional sustainable initiatives – localising sustainable development goals

Links between regional sustainability initiatives (RSI) and higher education institutions are often limited (Wells *et al.*, 2009; Mader *et al.*, 2013; Dlouhá *et al.*, 2013). Along these lines, Grindsted (2018) argues that regional planning for SDGs often mixes and matches between regional, business and environmental plans. There is often a missing link between different planning strategies within and across scales. Thus, various sustainability policies most frequently replicate a sectoral division between climate, energy and sustainability plans (Wells *et al.*, 2009; Peer and Stoeglehne, 2013) with the unintended consequence that they sometimes do not work in tandem (Mader *et al.*, 2013). In practice, different planning objectives overlap, sometimes with contradictory interests or means. Consequently,

planning in one sphere sometimes works against planning in another, simply because of different rationalities in play in different local planning sectors or at different spatial scales (Hulme, 2008). Sometimes it is because it has not been cross-sectorally contemplated or simply because planning also generates unintended side effects. While municipalities and local planners may be aware of such dilemmas, students might not be, which is why geographical methods and community-based fieldwork become an important learning strategy (Gould, 1999; Catling and Pickering, 2010; Beauregard, 2013; Stokes *et al.*, 2011) in addressing the SDGs. However, geographical methods in connection to SDGs in geography education have not been thoroughly studied. Further, Widener *et al.* (2016) find that geography courses sometimes lack integrated concepts of sustainability in their teaching programmes. Yli-Panula *et al.* (2020) identify 17 articles published in peer-reviewed scientific journals that comprehensively address geographical teaching and SDGs.

This study addresses this gap in the research by examining SDGs in relation to geographical fieldwork methods in geography teaching. The aim of this study was to investigate fieldwork methods (Hope, 2009), adjusting the SDGs into local contexts and citizenship (Catling and Pickering, 2010; Lugg, 2007) by using place-based learning (PBE) through a case study of a geography field course. According to Yli-Panula *et al.* (2020), 42% of sustainability teaching in geography centres around physical geography and environmental sustainability, which they relate to SDGs 12–15. By contrast, cultural knowledge of the place, which they relate to SDGs 10–11 and 16–17, is little addressed (14%) and links between the SDGs are little explored. By relating a geographical method course and student's fieldwork to real-world SDG problems developed in collaboration with a nature park and its municipalities, this case study also highlights intersectional planning, as well as scalar issues of implementing SDG solutions, putting it into local contexts, visions and planning schemes.

2. Presenting the course – geography in practice

Space, place and scale, landscape, nature and sustainability are core concepts in geography teaching (Mansfield, 2009; Yli-Panula *et al.*, 2020). Within this context, Geography in Practice is a 5 European Credit Transfer System undergraduate course that aims to introduce students to a wide variety of geographical field methods. Each method is introduced by a lecture and a subsequent exercise where the students are specifically tasked to address a real-world challenge by the application of the specific method introduced in the lecture. Besides presenting a new geographical method at each lecture, the learning goal is to acquire skills that enable the students to carry out geographical analyses and apply the methods to real-world problems (Learning goals – Geography in Practice). Several dogmas frame the course, including that each method is practised and not only taught (inspired by Brost and Bradley, 2006, among others). This involves eight short lectures around. In total, 10–20 min long, each introducing a new geographical method. Students put the method into practice in relation to SDG problems at a given location to emblem the local contextuality. One example is practising a regionalization method to compare present and previous land use at the case site (Åmosen Nature Park [NPA]), its forests, biosphere reserves and wetlands to analyse SDG 15. Thus, students work with a new method each lecture in a relevant geographical context, following inspiration from the wide range of academic literature including Gould (1999), Catling and Pickering (2010), Hope (2009), Stokes *et al.* (2011) and Jose *et al.* (2017) underscoring the importance of problem-based learning (PBL) and fieldwork in geography teaching, to mention a few. Rampasso *et al.* (2021) also argue for PBL and students' community engagement to drive social entrepreneurial thinking in addressing local sustainability issues.

Learning goals – Geography in practice:

(1) Knowledge:
- Knowledge on basic, geographical relevant fieldwork methods.
- Knowledge on circumstances and limitations to each fieldwork method.
- Knowledge on the umbrella of methods within geographical research.

(2) Skills:
- Acquire and use relevant methods during fieldwork.
- To be able to create an overview of the literature on geographical methods and acquaint oneself with the methods applicability to a specific geographical context.
- Apply the methods to tangible problems and challenges.

(3) Competences:
- Competence to use relevant geographical methods in the analysis of complex problems and challenges.
- Competence to plan fieldwork and to conduct relevant data and knowledge production.
- The competence to clearly and precisely circumstances relevant to the geographical analysis and disseminate its results to non-experts (own translation).

This implies that teachers do not present reading material, which should have been prepared prior to the lecture. Instead, preparation is a prerequisite for putting the method into practice (Brost and Bradley, 2006), thus simulating an inverted classroom approach where the specific activity must be prepared in advance by the student to allow ample time to practise methods rather than discuss them (Herreid and Schiller, 2013). Methods included in the lectures are business regionalization, cartographic mapping, city space analysis, etc [1]. Moreover, after each lecture and exercise students hand in a written assignment reflecting on the method, data collected and analyses. Each lecture prepares the students before a three-day field trip.

During the three-day field trip students work with a real-world SDG problem, prepared in collaboration with local stakeholders, municipalities, local business associations, NGOs, etc. The case used in this study is a newly established nature park. Student tasks are designed in around the NPÅ, Denmark (Figure 1), to develop an analysis and proposals that support communities towards taking steps based on sustainability.

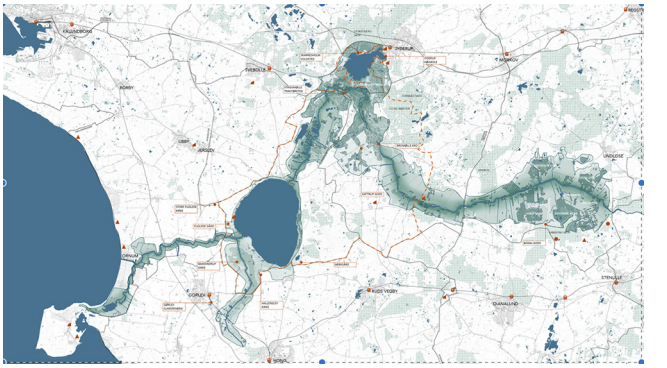

Figure 1.
NPÅ, Map by Norrøn

Figure 2.
Anonymous student assignment – Map of students' planning proposals

Awareness, attitudes and concerns of the students towards the local and regional issues covered in the course changed before and after fieldwork. At the first lecture, only 3 of 17 students answered that they had any interest in nature parks and local community development, whether personally or professionally and indeed most students demonstrated neither interest in how small towns reclaim their development nor in processes of regional marginalization or how to employ the SDGs in local community work.

3. Methods and materials

Jyderup is a small town dating from the eleventh century. For the past decade, the city has struggled with depopulation and declining retail. With approximately 4,000 inhabitants, the city is surrounded by unique environmental conditions and is located at the fringes of the large nature park. NPÅ covers 45 km^2 of lakes, bogs, moraine landscapes and historical sites (Naturpark Åmosen, 2019), including some of the best Northern European archaeological sites from the Hunting, Stone and Viking ages. NPÅ covers a drained system with the largest carbon-dense wetland on the island of Zealand (emitting methane and carbon dioxide). In total, 99% of the area is privately owned (Naturpark Åmosen, 2019) [2].

A total of 17 students from Roskilde University, with an average age of 22 years, participated in the final three-day field campaign. The students were from diverse backgrounds and were enrolled on this particular course as an elective part of their undergraduate programme. The respective undergraduate programmes at Roskilde University are all structured as broad foundational studies and students study either science, social science, humanities or science and technology, where traditional disciplines such as geography are studied as part of the overarching subject of their programme. Hence, students do not become graduates in e.g. Geography, but rather in Social Science. Generally, students attending this course are in their 4th to 5th semester. The students had no explicit geographical experience or knowledge of geographical methods, which is why the course aims to make use of the knowledge they have acquired in the other courses by exposing their existing methodological knowledge to spatial patterns, thereby introducing them to geographical methods. Furthermore, none of the students had any prior experience with local community-engaging fieldwork and none had much interest in life in the nature park and small towns, such as Jyderup. Indeed, several students begrudgingly commented on the fact that they found it more relevant to do fieldwork in Copenhagen, rather than in the countryside.

The educational fieldwork was conducted in collaboration with the local municipality, the nature park authorities and the local business association. The role of the teachers in designing the pedagogical approach both as facilitators that ensure close collaboration between students and local stakeholders and as organisers aims to provide clear alignment between local community needs and the learning objectives. As Rampasso *et al.* (2021) note, a collaboration between the local community and students stimulates entrepreneurial activity and the organizational setup of the course aims to ensure fieldwork activities that require local sensibilities from the students. Thus, the pedagogical approach suggests that fieldwork-based training provides a direct experience of sustainability challenges and offers methodological training to address them in the context, its location and circumstances where these challenges exist (Smith, 2002; Meadows, 2020; Kudo *et al.*, 2021). The field site situates the structure of the course in a real-world problem-solving context (Smith, 2002) where the students are deeply grounded, in particular, places and is highly democratic in their processes (Smith, 2002).

The teachers held several meetings with the municipality's planning division, the local business organization, the city's community building association and the nature park. A total of four pre-prepared student assignments were produced in collaboration between the course teachers and representatives and stakeholders from the local community, as well as planners from the local municipality. Thus, the educational fieldwork and student assignment tasks were designed ensuring the close connection between geographical methods and community needs. The teacher's role also involves coordinating stakeholder contacts for the different assignment tasks, local media and a presentation event for the city at the end of the course.

Prior to the fieldwork, local media broadcast the arrival and presence of the course and local citizens were encouraged to interact with and challenge the students. Also, the final event at which students present their results to the city and a panel of stakeholders, politicians and planners is advertised. The students are made aware of these arrangements from the beginning of the course and are specifically instructed to pay attention to the final arrangement. The aim is to set up a learning situation in which students know what is expected of them, to ensure local collaboration aligned with what Savin Baden (2003) terms self-facilitation role(s) in problem-based teams. Divided into working groups inspired by PBL and cooperative learning (Johnson and Johnson, 1999; Savin Baden, 2003), students engage in their appointed topics and tasks with the assistance of teacher guidance and support from appointed local resource persons. During the fieldwork, students have a list of contact persons from the city. They do group work, have group discussions and present their results to each other during evening working seminars. At these seminars, students connect their fieldwork with theory from the course to improve their planning proposals. This includes group discussion on the link between their planning proposals and the SDGs.

The SDGs, however, are neither cited as a learning objective nor as a specific assignment task. Rather, the local municipality presents the SDGs as their overall planning framework and the SDGs are introduced in group discussions. Furthermore, the teachers require students to assess their planning proposals against existing local plans and the SDG framework. This, the case site in a nature park and collaboration with local stakeholders framed the SDGs. Moreover, having local community development as the basis for the fieldwork, the problems and themes local stakeholders found valuable to examine remained the starting point, regardless of implicit or explicit SDG needs.

Hence, the training and acquisition of geographical field methods were kept in focus, but the problems and local challenges centred around the SDGs. In this way the fieldwork was not framed beforehand by established sustainability concepts and approaches but

developed from the community's needs, allowing students to explore different actor perspectives and approaches. This means NPÅ represents a case where multiple actors hold different views on what needs to be sustained and what to be developed in the nature park, thus different sustainability approaches co-exist within a limited territory.

The following four student assignments which formed the basis for the final three-day field campaign was:

(1) How is the NPÅ present in local business and retail? To address this issue, students were tasked with producing a classification of local retail and commerce and using this classification to map the spatial configuration of local stores and businesses. In addition, students were tasked with addressing the complicated issue of ways of and approaches to incorporating the surrounding nature park into the fabric of local commerce and production to enhance the mutual benefits, for the local community and nature park alike, to be gained by supporting SDGs 11 and 12.

(2) How can local access to the park be facilitated through spatial designs and route planning to invite local residents, as well as visitors from further away to use the park and its many routes and paths? Here, the students were tasked with producing detailed mapping of existing routes and paths and combining these with a landscape character assessment analysis (Caspersen, 2009). Finally, the students were encouraged also to exhume local folk tales and stories and to apply all three sources of data into a coherent spatial design and design rationale for further routes and paths in the nature park. Hence, this task was very much oriented towards awareness generation and citizenship aligned with SDG 15.

(3) In the third task, students worked with tourism development and tourist infrastructure designed around SDG 17. Specifically, the students were supposed to carry out phenomenological interpretations of the centre of town and to relate to the way the town centre portrays itself through window decorations and so on. Many tourists demand more sustainable and local alternatives for their vacation. This type of representation analysis was to feed into the students' plan for the town and how the town could and should present itself and its location close to the nature park to attract more visitors.

(4) Finally, the students were tasked with producing a plan for a comprehensive spatial design of the town's small squares and open spaces. They were asked to address how the squares and open spaces were used, by performing a detailed mapping of squares and open spaces and carrying out a Lynch-inspired analysis (Pearce and Fagence, 1996) of the overall structure of the town, applying a traditional flow analysis of transport, as well as people. The result of this final task was the presentation of a comprehensive plan for the small squares that would support community engagement around SDGs 15 and 17 and align the town with the nature park, effectively turning the small squares into focus points for information on biodiversity and nature in the area, nature-based activities or recreational facilities.

After three days of fieldwork, the students presented their work to a panel of town representatives including local politicians, nature park representatives, key stakeholders in the administration and the business association. Additionally, more than 50 citizens also participated in the final presentation and some entered into debate with the students during and after their presentations. The solutions were presented to the local stakeholders and

local media. The students later analysed the results and these were summarised and submitted with the reports. The course ended with a final report sent to all stakeholders involved, including the municipality, politicians and local associations. The empirical material also included the 17 students' field notes, recorded presentations and their written assignments, including reflections on their learning and competences for future work. The aim of this case study was not to find evidence of x, w and z, improving or disproving the quality of teaching and students' associated learning outcomes. Rather, we adopted the tradition of experience-based practice (Brost and Bradley, 2006; Biggs and Tang, 2011), which is why student awareness and local community engagement are assessed as to their negative or positive connotations during fieldwork, the assessment task or the final evaluation of the course.

4. Results and discussion

At an overall level, contextualising the SDGs with and within fieldwork methods helps students to identify and become aware of local issues. Also, students reflect upon how relevant fieldwork and data-producing methods can be used in local problem-solving and the design of possible solutions. Having presented their thoughts and results to local stakeholders, the students experience local governance in practice, as politicians, local stakeholders and citizens debate the findings. The students learn first-hand how their suggestions can be seen as counterproductive by some of the local stakeholders while remaining attractive to others, crisscrossing across spatial levels, stakeholder positions and political points of view.

This necessitates a learning process of acknowledging ambivalences inherent in different SDG agendas. Furthermore, this leads students to understand and appreciate the complexity of the field site studied. Student presentations and planning suggestions, as well as feedback from citizens and stakeholders as part of local networked decision-making give students a contextual understanding aligned with the SDGs. Having students work with problems defined in collaboration with the municipality further aims to allow the students to critically reflect upon the traditional and often obvious lack of coherence between policy areas and citizenship relevant to local planning on SDGs, as well as combining critical thinking with entrepreneurial sustainability.

In the following, the authors discuss major findings and experiences from the fieldwork and how the fieldwork relates to the students' conception of SDGs and how to engage in SDGs in a local setting.

Students collected data on various aspects of local life in Jyderup, paying special attention to studying local shops and businesses and the surrounding nature park. All business premises in the main street were identified, catalogued and located to analyse the business structure and commercial functions of the village.

The students were tasked with producing a generalised map of the business structure, dividing local businesses into branches. The result of this mapping exercise and many of the student observations and the following statements engaged local stakeholders considerably: students found neither shops on the main street accommodating tourist facilities nor any tourist sights, attractions or experiences. A former tourist information desk identified by the students was no longer in service and it generated a lively debate among local stakeholders questioning the students about the seeming conundrum of a town being located at the edge of a nature park, but not engaging in the development of nature-based tourism or branding. What about exhibiting local products and the nature park in the shops and having a tourist information desk at the station inviting passengers in the nature park to give their first impressions? students asked.

Similarly, students' mapping of business features demonstrated that no local retailers referred either to nature experiences or to the nature park as follows: the

beautiful surrounding landscapes, the bogs and wetlands and its wildlife or some of the best-preserved archaeological sites from the Stone Age in Northern Europe. Students then presented local heritage from the nature park that they found could develop into an additional part of a shopping experience. In addition, students tasked with examining small squares and open spaces in the village identified a similar disconnect between the spatial layout of the town and the fact that no references in the open spaces and landmarks were made.

Hence, during their fieldwork, students became exposed to several dilemmas: expanding tourism and tourist experiences and shopping in and around the park in accordance with the wishes of the local business association would impact local environments, local wildlife and add pressure on local ecosystem services. Thus, they found SDGs 13 and 14 in conflict with further stimulating shopping and consumption (SDG 12). At the same time, students argued that stimulating local tourism both supports community-based development (SDGs 8 and 11) and tourist responsibilities towards the local community and the environment once tourism is oriented towards appreciating nature and outdoor learning. These discussions led the students to connect local tourism with mass tourism and the multi-scalar and multi-faceted complexities in local SDG solutions became a focal point in the discussion that followed.

To elaborate some of these discussions further, students also proposed to establish a green corridor in the main street that leads directly into the nearby forest. Such a green corridor could link retailers and the business district located on the main street directly with the new routes, hiking and biking trails and the nature park itself. In addition, the students wondered whether their SDG 11 suggestion would link or collide with SDG 12 if retail were designed as a nature-based experience for visitors that is directly associated with the forest, the lakes and the nature park. However, the proximity of the village to the nature park and the nearby lake was also identified by the students as a point of some contention: while some stakeholders and developers were trying to get approval for a nature-based playground next to the lake, local representatives of the Danish Society for Nature Conservation rejected any such ideas and maintained that such an initiative would clash with contemporary nature conservation and disturb the wildlife.

The students also identified this conflict of interest as a reflection of a wider tension between development goals, namely, the goal of developing local sustainable cities and communities (SDG 11) and the need to protect life on land (SDG 15).

While solving these local conflicts of interest was never the explicit purpose of the course, it was a very striking experience for the students to delve into a discussion with local stakeholders on issues of clear importance to the community and the individual stakeholders.

The students also made proposals for tracks and trails in and around the village and nearby lake with the intention of strengthening local tourism and nature experiences. The students produced a map of their suggestions and this map formed the basis for further discussion about the role of nature conservation versus a developing tourist industry. Within this wider discussion, the students identified a nearby former camping site as having the potential for further development, for instance as a place for information dissemination about the park, its natural life and the landscape. Also, this discussion developed into a larger discussion as various stakeholders contributed to it with their own visions for that area. Again, this is interpreted as a case of illustrating the multi-scalar nature of the SDGs and how larger-scale issues may become challenges at a local level.

Student reflections on their learning from practising fieldwork are as follows:

- The way the course was taught has helped me to contextualise theories and add a perspective of reality to my studies.
- The course gave me the option of understanding how relevant real-world tasks may look and how they can be approached.
- Having to communicate our ideas (and results) to non-experts has brought me out of my academic bubble and has forced me to reflect upon my own work in relation to the real world.
- Being able to use my knowledge of geography skills to help other people has been extremely interesting and rewarding.
- I have begun to see the world differently. I discussed this with my fellow students and it was difficult to find the right words. In the end, we agreed that we now, finally, know what it means to think spatially.
- It became clear what planning is all about and how different actors have such contrasting views even in a small place like Jyderup.
- It has given me a clear understanding of how, as a planner, you engage with reality and see how the town and the surroundings are interconnected. It is much more complex than you would think.
- It is clear to me that things are much more complex than they appear at first sight.
- I now have a much greater understanding of how complex these phenomena are and how political, cultural and physical aspects come together to produce specific geography.
- The course has taught me to trust and rely on my own ideas!

Student reflections on their learning from practising fieldwork represents some of the reported statements by the students at the conclusion of the course. While Student reflections on their learning from practising fieldwork is not a complete transcription of all the comments made by the students, it is nevertheless clear that many of the students point to their own learning much more than the results they produced during the fieldwork. Most of the students identify the meeting with "reality" as an eye-opening experience and something that has prompted them to address their own understanding of the complex structures that make up everyday life in a small town such as Jyderup. The multi-scalar understanding of their own work is particularly identified by many students as being central to their understanding of geographical methods and of the use of SDGs in analysis and planning.

By way of illustration, a former camping site near the Skarresø lake in the nature park was puzzling and of some concern among local stakeholders. While the municipality had previously tried three times to outsource the camping site to be commercially driven without success, in the end, it turned out to be a landmark and symbol for the citizens. People living outside the village argued to convert the site into a gateway into the nature park, with information signs, shelters, etc. Here, students found themselves exposed to a planning conflict which they aimed to open via the SDGs. The students worked with regionalization methods and mapped the history of the place and its different land use practices during the past 120 years or so. Furthermore, they identified the previous pollution (SDG 15) from the industrial era but also found that the lake had been used for swimming and recreational activities, even with a recreational resort in the early 1900s, before the lake was polluted. The industrial pollution of the lake thereby opened up the multi-scalar nature of the SDGs and their ambivalences (Liverman, 2018; Salvia *et al.*, 2019). Students did not produce novel

proposals, neither for re-establishing a camping site nor for a nature park gateway. Rather, they found the different stakeholder positions becoming conflictual and a conflict arising between SDGs 15 and 11: while a nature park gateway with a strong rewilding aspect would best restore biodiversity losses (SDG 15), it was less supportive of local community engagement (SDG 11). This made the students suggest that the main issue was to focus on restoring ecosystem services and rewilding nature. Rather than intervening in the conflict, the students maintained the issue of rewilding and establishing a "playground" that would attract visitors to the nature park. Furthermore, the students proposed to incorporate in this playground clear and detectable information on where to go to further explore the different geological landscape characteristics and informed the different parties drawing from their regionalization of the SDGs and the history of the place. Much like Demirci *et al.* (2018) and Meadows (2020), understanding such multi-scalar socio-environmental processes makes the students analyse and localise the SDGs from a systemic level.

Apart from the engagement with SDGs and the discussion surrounding their multi-scalar nature (Liverman, 2018), the fieldwork had a significant impact on students' awareness of, attitudes to and concerns about the village and its characteristics and circumvent to Mammadova (2019). This is outlined in Student reflections on their learning from practising fieldwork where student statements before and after the fieldwork are summarised. In general, students found the fieldwork provided an opportunity to identify and become aware of local issues by applying methods that produce data from local stakeholders and local distinctiveness. It is not clear from Student reflections on their learning from practising fieldwork whether this is the result of the actual data production or indeed it is the result of the students being present in the nature park village and interacting with local citizens or indeed a mix of the two. In any case, the attitudes of the students changed significantly during the three days: what seemed like a reluctant attitude upon arrival in Jyderup was, at the conclusion of the fieldwork, inverted into a clear desire to continue working in the village and in collaboration with the local stakeholders on how to integrate the city with the nature park.

The contextual elements of the field are, thus catalysed into the data produced and the actual learning situation. Hence, this fieldwork entailed a learning strategy that helped students to understand the contextual and spatial circumstances of a particular case and highlighted how methods applied in each fieldwork situation need adjustment and attention must be paid to localising methods (Beauregard, 2013), as well as the results produced. Understanding the circumstances under which data are produced is paramount for interpreting the spatiality and contextual elements in analysing a local community and the role played by the SDGs. Likewise, the literature on geography education finds that fieldwork enhances the learning potential. Friess *et al.* (2017, p. 547) suggest that classical fieldwork is best in terms of deep learning. At the same time, Salvia *et al.* (2019) argue that research on SDGs does not sufficiently identify ways to implement them, regardless of fieldwork methods. This study has addressed this issue, pointing to geographical methods and field course activities to interact with society and local communities and how to work with SDGs in a local context. Contextualising the SDGs with fieldwork methods helps students to identify and become aware of local issues (Mammadova, 2019) and further an understanding of the complexity of studied fields and phenomena. This study focussed on a Danish context and this can be cited as a limitation of this research. The result, however, could serve as a base for further analysis and development of courses and practical cases where SDGs meet real-world challenges in various contexts.

5. Conclusion

Fieldwork and PBE help students contextualise the multi-scalar nature of the SDGs and thereby apply them to analyses in a local context. Exposed to real-world problems and

tasked with collecting data, conduct analyses and present planning proposals for local stakeholders, students engage with stakeholder positions. The students learn first-hand how their suggestions can be seen as counterproductive by some local stakeholders while remaining attractive to others. Thus, localising the SDGs situates students in a learning position whereby the latter is directed towards the multi-scalar governance of the SDGs. Hence, the students become exposed to scalar ambivalences inherent in different SDG agendas on what needs to be sustained and what needs to be developed in the nature park. Student presentations and planning suggestions, as well as feedback from citizens and stakeholders as part of local networked decision-making, give students a contextual understanding aligned with the SDGs. Localising the SDGs by practising fieldwork within a local community not only stimulates students and their awareness of, attitudes to and concerns about local community challenges but also it provides new insights and perspectives for the local stakeholders, who appreciate the proposals to develop the nature park further. Exemplified by debates among local stakeholders, questioning the students about the apparent conundrum of a town being located at the edge of the nature park but neither making any explicit reference to it nor engaging in the development of nature-based tourism provides significant inputs for the establishment of trails, information spots and infrastructure for further development – situating students' findings between stakeholder positions. The conclusions can have major implications for teaching sustainability in higher education. For example, the results can be used in the development of universities' strategic RSI and local collaboration along with SDG curricula development. Moreover, programmes that are trying to incorporate SDGs could incorporate local community or practice-based SDG challenges to enhance sustainability education, if students better learn to tackle the multi-scalar complexity of creating solutions for the local community. If so, what is the best way to do this? Maintaining the methodological and theoretical aspects of different disciplines by adopting and modifying the fieldwork model could offer a path towards SDG acquisition of implementation skills. An interesting future research study would be to look at how students' critical thinking on SDG contradictions and ambivalences meets their entrepreneurial thinking and the solutions students come up with to enhance their possible local SDG impact.

Notes

1. We will not go further into detail with each lecture but focus on the field trip. As an example, the lecture on business regionalization aims to introduce students to a geographical method that allows them to conduct a spatial analysis of physical commercial functions and structures, their networks and/or relations. Thus, students learn to produce geographical data on business characteristics that enable them to study the local village in NPÅ and bring forward proposals to local stakeholders, and thus assist them with their struggle to uphold vital functions in the city (SDG 11).
2. Regulations allow individuals to walk and cycle on existing roads and paths on private open and forested land. However, advertised and organised business and non-business activities are prohibited unless cleared with the landowners, who can also restrict access in case of hunting activities (Naturpark Åmosen, 2019).

References

Beauregard, R. (2013), "The neglected places of practice", *Planning Theory and Practice*, Vol. 14 No. 1, pp. 8-19.

Biggs, J. and Tang, C. (2011), *Teaching for Quality Learning at University*, Open University Press, Berkshire.

Brost, B. and Bradley, K. (2006), "Student compliance with assigned reading: a case study", *Journal of Scholarship of Teaching and Learning*, Vol. 6 No. 2, pp. 101-111.

Caspersen, O.H. (2009), "Public participation in strengthening cultural heritage: the role of landscape character assessment in Denmark", *Geografisk Tidsskrift-Danish Journal of Geography*, Vol. 109 No. 1, pp. 33-45.

Castree, N. (2015), "The anthropocene: a primer for geographers", *Geography*, Vol. 100 No. 2, pp. 66-75.

Catling, S. and Pickering, S. (2010), "Mess, mess, glorious mess", *Prim. Geogr*, Vol. 73, pp. 16-17.

Chalkley, B. (2006), "Education for sustainable development: continuation", *Journal of Geography in Higher Education*, Vol. 30 No. 2, pp. 235-236.

Demirci, A., Miguel-Gonzales, R. and Bednarz, S.W. (2018), *Geography Education for Global Understanding*, Springer, Cham.

Dlouhá, J., Barton, A., Huisingh, D. and Adomssent, M. (2013), "Learning for sustainable development in regional networks", *Journal of Cleaner Production*, Vol. 49, pp. 1-4.

Friess, A.D., Oliver, A.J.H., Quak, M. and Lau, Y.A. (2017), "Incorporating 'virtual' and 'real world' field trips into introductory geography modules", *Journal of Geography in Higher Education*, Vol. 40 No. 4, pp. 546-564.

Gould, P. (1999), *Becoming a Geographer*, Syracuse University Press, New York, NY.

Grindsted, T.S. (2015), "Educating geographers in an era of the anthropocene: paradoxical natures – paradoxical cultures", *Journal of Cleaner Production*, Vol. 106, pp. 320-329, doi: 10.1016/j.jclepro.2014.10.086.

Grindsted, T.S. (2018), "Regional planning, sustainability goals and the Mitch-match between educational practice and climate, energy and business plans", *Journal of Cleaner Production*, Vol. 171, pp. 1681-1690, doi: 10.1016/j.jclepro.2016.09.197.

Herreid, C.F. and Schiller, N.A. (2013), "Case studies and the flipped classroom", *Journal of College Science Teaching*, Vol. 42 No. 5, pp. 62-66.

Hope, M. (2009), "The importance of direct experience: a philosophical defense of fieldwork in human geography", *Journal of Geography in Higher Education*, Vol. 33 No. 2, pp. 169-182.

Hulme, M. (2008), "Geographical work at the boundaries of climate change", *Transactions of the Institute of British Geographers*, Vol. 33 No. 1, pp. 5-11.

Johnson, D. and Johnson, R. (1999), "Making cooperative learning work", *Theory into Practice*, Building Community through Cooperative Learning, Vol. 38 No. 2, pp. 67-73.

Jose, S., Patrick, P.G. and Moseley, C. (2017), "Experiential learning theory: the importance of outdoor classrooms in environmental education", *International Journal of Science Education, Part B*, Vol. 7 No. 3, pp. 269-284.

Kudo, S., Omi, K., Florentin, K. and Allasiw, D.I. (2021), "Key experiences for the trans disciplinary approach: fieldwork-based training in sustainability science education", *International Journal of Sustainability in Higher Education*, Vol. 22 No. 3, pp. 615-634.

Liverman, D. (2018), "Geographic perspectives on development goals: constructive engagements and critical perspectives on the MDGs and the SDGs", *Dialogues in Human Geography*, Vol. 8 No. 2, pp. 168-185.

Lugg, A. (2007), "Developing sustainability-literate citizens through outdoor learning: possibilities for outdoor education in higher education", *Journal of Adventure Education and Outdoor Learning*, Vol. 7 No. 2, pp. 97-112.

Mader, M., Mader, C., Zimmermann, F.M., Görsdorf-Lechevin, E. and Diethart, M. (2013), "Monitoring networking between higher education institutions and regional actors", *Journal of Cleaner Production*, Vol. 49, pp. 105-113.

Mammadova, A. (2019), "Sustainable development goals as educational tools to raise students' awareness of the rural development of biosphere reserves: a case study of mount hakusan biosphere reserve", *Business Strategy and Development*, Vol. 3 No. 2, pp. 195-203.

Mansfield, B. (2009), "Sustainability", in Castree, N., Demeritt, D., Livermann, D. and Rhoads, B. (Eds), *A Companion to Environmental Geography*, Wiley-Blackwell, Malden, MA.

Massey, D. (2005), *For Space*, Sage, Thousand Oaks, CA.

McLuhan, M. (1966), *Understanding Media: The Extension of Man*, McGraw-Hill, New York, NY.

Meadows, M. (2020), "Geography education for sustainable development", *Geography and Sustainability*, Vol. 1 No. 1, pp. 88-92.

Naturpark Åmosen (2019), "Naturpark åmosen", available at: http://naturparkaamosen.dk/

Nightingale, A. (2018), "Geography's contribution to the sustainable development goals: ambivalence and performance, commentary", *Dialogues in Human Geography*, Vol. 8 No. 2, pp. 196-200.

Peer, V. and Stoeglehner, G. (2013), "Universities as change agents for sustainability–framing the role of knowledge transfer and generation in regional development processes", *Journal of Cleaner Production*, Vol. 44, pp. 85-95.

Pearce, P.L. and Fagence, M. (1996), "The legacy of Kevin Lynch: research implications", *Annals of Tourism Research*, Vol. 23 No. 3, pp. 576-598.

Rampasso, I.S., Siqueira, R.G., Martins, V.W.B., Anholon, R., Quelhas, O.L.G., Leal Filho, W., Lange Salvia, A. and Santa-Eulalia, L.A. (2021), "Implementing social projects with undergraduate students: an analysis of essential characteristics", *International Journal of Sustainability in Higher Education*, Vol. 22 No. 1, pp. 198-214.

Salvia, A.L., Filho, W. and Brandli, L.L. (2019), "Assessing research trends related to sustainable development goals: local and global issues", *Journal of Cleaner Production*, Vol. 208, pp. 841-849.

Savin Baden, M. (2003), *Facilitation Problem Based Learning, Chapt. 4, Being an Effective Facilitator*, Open University Press, Berkshire.

Smith, G.A. (2002), "Place-based education: Learning to be where we are", *Phi Delta Kappan*, Vol. 83 No. 8, pp. 584-594.

Steffen, W., Grinevald, J., Crutzen, P. and McNeill, J. (2011), "The anthropocene: conceptual and historical perspectives", *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, Vol. 369 No. 1938, pp. 842-867.

Stokes, A., Magnier, K. and Weaver, R. (2011), "What is the use of fieldwork? Conceptions of students and staff in geography and geology", *Journal of Geography in Higher Education*, Vol. 35 No. 1, pp. 121-141.

Swyngedouw, E. (1997), "Neither global nor local: 'glocalization' and the politics of scale", in Cox, K.R. (Ed.), *Spaces of Globalization: reasserting the Power of the Local*, Guilford Press, New York, NY and London, pp. 137-166.

Wells, P., Bristow, G., Nieuwenhuis, P. and Christensen, T.B. (2009), "The role of academia in regional sustainability initiatives: Wales", *Journal of Cleaner Production*, Vol. 17 No. 2, pp. 1116-1122.

Westaway, J. (2009), "A sustainable future for geography?", *Geography*, Vol. 94 No. 1, pp. 4-12.

Widener, J.M., Gliedt, T. and Tziganuk, A. (2016), "Assessing sustainability teaching and learning in geography education", *International Journal of Sustainability in Higher Education*, Vol. 17 No. 5, pp. 698-718.

Yarnal, B. and Neff, R. (2004), "Whither Parity? The need for a comprehensive curriculum in human-environment geography", *The Professional Geographer*, Vol. 56 No. 1, pp. 28-36.

Yli-Panula, E., Jeronen, E. and Lemmetty, P. (2020), "Teaching and learning methods in geography promoting sustainability", *Education Sciences*, Vol. 10 No. 1, pp. 1-18.

Further reading

Nordea Fonden (2019), "Nordea fonden: Vi støtter gode liv", available at: https://nordeafonden.dk/nyheder/flere-gaester-til-vestsjaellands-natur-og-kulturskatte

About the authors

Thomas Skou Grindsted is an urban political ecology Scholar. His research studies SDGs in urban governance. This includes education for sustainable development (ESD) and fieldwork didactics in geography and planning educations to examine the knowledge base upon which geographers, urban planners and architects shape the cities of tomorrow. Thomas Skou Grindsted is the corresponding author and can be contacted at: tskoug@ruc.dk

Thomas Theis Nielsen is a Geographer with expertise in Remote Sensing, Geographic Information SYstems and Urban and Regional Planning. He studies fieldwork methods particularly in connection to municipal and local planning. Moreover, his work concentrates on SDGs and participatory mapping methods.