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# Developing outdoor spaces for work and study—an explorative place-making process

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**Introduction:** The development of outdoor spaces for work and study is part of a larger transition toward sustainable communities, which can take advantage of more flexible ways of organizing everyday life. Governance processes supported by physical spatial changes have the potential to bring together various actors and experts for local development. The aim of this study was to explore the possibilities of developing outdoor spaces for work and study in a collaborative process.

**Methods:** The study involved an upper secondary school, a local government administration, local businesses and research. The process took place in a South-Swedish small town and included developing outdoor areas for tasks traditionally carried out indoors, participatory workshops and meetings followed up through questionnaires and interviews.

**Results:** Overall, the introduction of outdoor places was positively evaluated, but engagement varied across actors and over time, and a number of obstacles and challenges in the process were identified.

**Discussion:** The study showed how vital it is to anchor ideas for place-making locally and having key persons in leading positions with allocated time to support the process. It also indicates how decisive spatial changes can be and how important it is that any physical intervention becomes an integrated part of a wider local process in order to make an imprint on local life and pedagogical practice.

## KEYWORDS

outdoor office, outdoor education, local development, prototypes, health promotion, green settings, youth, school

## 1 Introduction

The development of outdoor offices is part of a larger transition toward sustainable communities with a more flexible work-life including health promoting practices. This requires bold initiatives, which can take advantage of technological advancements and be coupled with inventiveness in social practice, updating the way various work tasks are organized and carried out (Pettersson Troije et al., 2021). So far there has been a tendency for higher flexibility enriching the work-life of those already having a larger range of freedom in how their tasks are performed (Kossek and Lautsch, 2018). People in creative jobs tend to have more access to attractive facilities by the workplace and use various facilities while traveling or staying in parks, cafés and other urban settings (Hoff, 2014). Small towns and settlements can have attractive green surroundings serving similar functions and other types of underused infrastructure potentially housing more expansive and creative activities of people and business (Nordström and Mårtensson, 2001).

Outdoor environments with proximity to nature can play a vital role in the local development of small towns, in particular when attractive also to the younger generation. Young adults leaving the place where they grew up and went to school, tend to have emotional bonds to this place with the presence of nature being one important factor

(Rönnlund, 2020). The exchange with nearby larger cities in a region is vital for small towns to flourish (Courtney and Errington, 2000). However, not only local business is important, but also non-commercial activities and the overall design and maintenance of the physical environment (Wahlberg, 2016).

It is well-documented that time outdoors and green outdoor environments are important for human development, health and wellbeing in several ways and dimensions (Frumkin et al., 2017; Hu et al., 2022), also for children and youth (Wales et al., 2022). Workplaces and schools are particularly important as people spend a large share of their time there. Still, many people become too sedentary, associated with indoor office work and studies in these settings. Children in Sweden get only a small share of the daily exercise they need during a school day and girls in particular tend to get low levels of physical activity (Mårtensson et al., 2014; Pagels et al., 2014). The use of digital tools takes much time from other important activities associated with more multimodal sensory input necessary for a healthy development (Collishaw, 2015; Soga and Gaston, 2016).

Research has documented how greenery including indoor plants and vistas toward the surroundings can support wellbeing and productivity among office workers (Bringslimark et al., 2007; Lottrup et al., 2013; Gilchrist et al., 2015; Hyvönen et al., 2018). More specifically, there are mechanisms in proximity to green and blue settings supporting mental restoration (Kaplan, 1995), making it easier for children to concentrate and manage school (Mårtensson et al., 2009; Kuo et al., 2019). There are also indications of contacts with nature having effects on the socio-emotional development of children and youth (Mygind et al., 2021) and being supportive in their development of various life-skills (Chawla, 2015). Studies with secondary school children in Greece showed their appreciation for flowers, trees and shrubs in the schoolyard and how they associated these contacts with learning and wellbeing (Akoumianaki-Ioannidou et al., 2016). Similarly, Jansson et al. (2018) identified a general wish for green schoolyards among students in secondary schools in Sweden, spaces they wanted to use for various activities including tree climbing, socializing and bringing their studies outdoors.

Interventions involving office workers in both Sweden (Pettersson Troije et al., 2021) and Denmark (Smut Ud, 2023) have experimented with bringing work tasks outdoors. This has involved elaborating on how to adapt various tasks to the outdoors, but also searching for sites with a good fit for particular tasks. Related to children and youth, an overview of the literature on outdoor education in the Nordic countries by Remmen and Iversen (2023) showed that most studies concern primary schools from teachers' perspectives with a knowledge gap on how to design tasks for outdoor learning among students in upper secondary schools. Some Swedish studies from primary schools highlight the particular opportunities and challenges of moving tasks outdoors applying a dual teacher and student perspective (Fägerstam, 2013; Mårtensson and Fägerstam, 2020).

Despite the many documented benefits of outdoor studies and offices, the infrastructure supportive of their realization is usually lacking. Outdoor furniture can be added, but also steps taken toward a more creative management of green surroundings with more substantial additions such as paths for walking,

sun-protection or hot-spots for internet connection (Pettersson Troije et al., 2021; Lygum et al., 2023). Interventions require a mix of ideas for the physical environment and the social environment in order to be able to renegotiate norms and develop new solutions (Pettersson Troije et al., 2021). Place-making processes with co-production can then contribute to local community development and sense of place (Ellery and Ellery, 2019). A place-based approach to outdoor education encourages a situated, dynamic and process-oriented relationship to place (Sandell and Öhman, 2010). This type of approach can add health promoting contact with nature and physical activity to children and youth during the school day (Mårtensson and Fägerstam, 2020).

Place-making needs attention when a space is to become part of already established everyday practices (Fägerstam, 2011). The physical (material) conditions need to align with what is conceived as compatible with an educational practice in line with the curriculum (Rönnlund, 2020). Staff and citizens have expectations for what they recognize as a good working environment. Earlier studies have revealed that the process of moving office work outdoors can get complicated when habits and norms related to everyday chores are challenged (Pettersson Troije et al., 2021). In an educational context, ideas from discourses of outdoor education potentially destabilize established norms and procedures for the professional practices of teachers (Fenwick et al., 2012). Introducing new ideas on how to modify places in work-life in order to support creativity tends to be equally challenging (Hoff, 2014) and needs a leadership that "shows the way out" (Pettersson Troije et al., 2021).

In small towns, local schools can make up important arenas for local place-making (Nordström and Mårtensson, 2001) with nearby green and blue settings as vital resources when bringing tasks outdoors in both schools (Mårtensson and Fägerstam, 2020) and offices (Pettersson Troije et al., 2021). Prototyping can offer an arena to explore locally meaningful and resilient solutions which convey ownership of space and tasks to the ones involved. Prototypes, including social and physical dimensions, can facilitate processes when many people need to coordinate their ideas, thoughts and actions, with spatial arrangements experienced and tested, creating awareness of systemic relations, societal deficits and community strength (Wolfram et al., 2019). In efforts for local development, local governance processes including multi-actor co-development and co-management are vital but also challenging (Jansson et al., 2019). In this study, we focus on how outdoor places for work and studies can be co-developed through a place-making process supportive to the health and wellbeing of citizens and the attractiveness of a small town, as part of a wider local process aiming for sustainable development.

## 2 Aim and research questions

The aim of this study is to evaluate a local, collaborative place-making process of moving tasks in school and work-life outdoors, creating new types of outdoor offices.

The following research questions have guided the study:

- How can a collaborative process of place-making evolve?

- What kind of prototypes for outdoor study and work take form?
- What ideas of places, facilities and activities for outdoor study and work evolve?
- How do different stakeholders evaluate the process?

## 3 Methods

### 3.1 Research design

This is an explorative study of an innovation and development project on establishing outdoor offices, using multiple methods to capture how actors act and interact in a process of local place-making. The study documented, analyzed and evaluated a process where the facilities of an upper secondary school and an adjacent local knowledge hub called the Science house became the primary focus. In the project, headed by a local government, we formed a research team from the Swedish university of agricultural sciences (SLU). We participated serving the various actors with formative feedback throughout the process as well as carrying out a project evaluation through questionnaires and interviews, as shared in this paper. The project lasted 2 years, from October 25, 2021 until September 30, 2023 (see Figure 1).

### 3.2 The case

The geographic area in focus for this project is located in a small town with around 5,000 inhabitants making up the main settlement of a south-Swedish municipality dominated by rural land. A background to the project is the difficulty among the economically successful local companies to attract well-educated staff. The idea is that attractive surroundings facilitating new ways of living can help to create liveable places where industry can flourish and young people find motivation to study and possibilities to stay for making a living.

The project was initiated by a consultant on development hired by the local government and developed in collaboration between the research team, the Science house and the local government, involving mainly staff from a unit responsible for local industry. The aim as formulated in the application for funding to the Swedish Innovation Agency was to “develop and test various prototypes for outdoor study and working spaces and more specifically study what is required from planning and design to create supportive structures for various types of working tasks to be able to be moved outdoors.” The application further described how the main idea for the project was to, through physical structures and policy work, “test out prototypes for the outdoor working place as an arena for attractive living environments and local societal development and test locally in relation to existing meeting places.”

The project was initially planned as five work packages: project leadership (including coordination and anchoring of detailed project plan); planning and development (including dialogues and workshops with several actors); design, engineering and construction of prototypes (including idea development and prototype construction); testing (including arrangement of activities for several actors around the prototypes); and evaluation (including participatory observation, interviews and questionnaires

by SLU). Throughout the project time, plans were adjusted, and the collaboration with the local upper secondary school turned into the core of the project, with less focus on the Science house and other local partners.

The potential infrastructure for outdoor offices acknowledged in the beginning of the project consisted of outdoor spaces by the local upper secondary school, areas adjacent to the Science house and the extensive green surroundings of forest and lakes, including a winding system of paths, piers and shelters (see Figure 2). The schoolyard consists of paved open surfaces dominated by car parking at the northern side of the building, and on the other side there are benches and tables by lawns and some small trees. The school is surrounded by roads on three sides and on the other side of the road is the Science house with extensive lawns. The intention, according to the application, was to develop local infrastructure forming prototypes for outdoor work collaboratively *in situ*, which would allow “individuals to switch and adjust the physical situation in relation to type of working task, social context and personal factors concerning capacity, needs and ideas and wit of the day.” Further the idea was that any more or less permanent structures and everyday practices established during the project period would add value to the small town. Specific goals were to improve wellbeing, motivation, creativity and satisfaction among students and others, improving local collaboration and a positive development for inhabitants and the town at large.

Three suggested prototypes for outdoor office studies and work were mentioned already in the application; (1) walking environments, (2) outdoor offices and (3) maker spaces. Walking environments would consist of routes through the local environments which were identified to increase mobility for “walk and talks,” “think walks” or outdoor reading. Outdoor offices would be settings adapted to take advantage of working outdoors adjusted to handle the impact of season and weather. Maker spaces, finally, are spaces for co-creation with knowledge exchange and reuse of material at the core. A maker space would take advantage of both indoor and outdoor facilities where people, companies and associations can test business ideas and innovations through for example constructions, sales and expositions.

### 3.3 Project meetings and participatory workshops

The research team took active part in various activities during the process. We attended project meetings, organized workshops and had working meetings in order to discuss with local actors on how to implement outdoor offices for work and studies. The project coordinator was present at all meetings and was the primary link to the field for researchers. The headmaster and the head teacher at the local upper secondary school would participate more or less intensely during different phases of the process. Further, a number of workshops involving the students and their teachers were designed to stimulate to an extended use of their surroundings, events also making up important opportunities for gathering research data through participatory observation.

There was one larger meeting involving all parties when starting up the project in early December 2021 and one larger final event in the Science house in late August 2023. A total of three larger



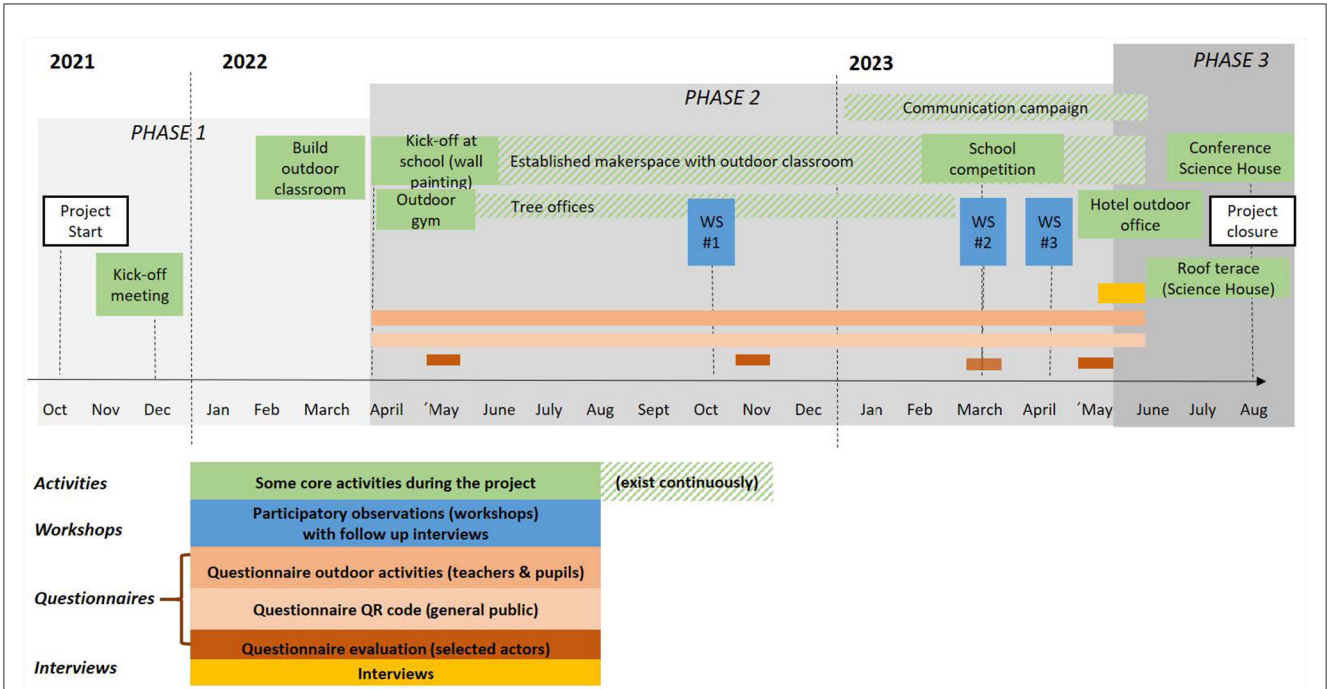


FIGURE 1 Simple timeline of the project's core activities and data collection.

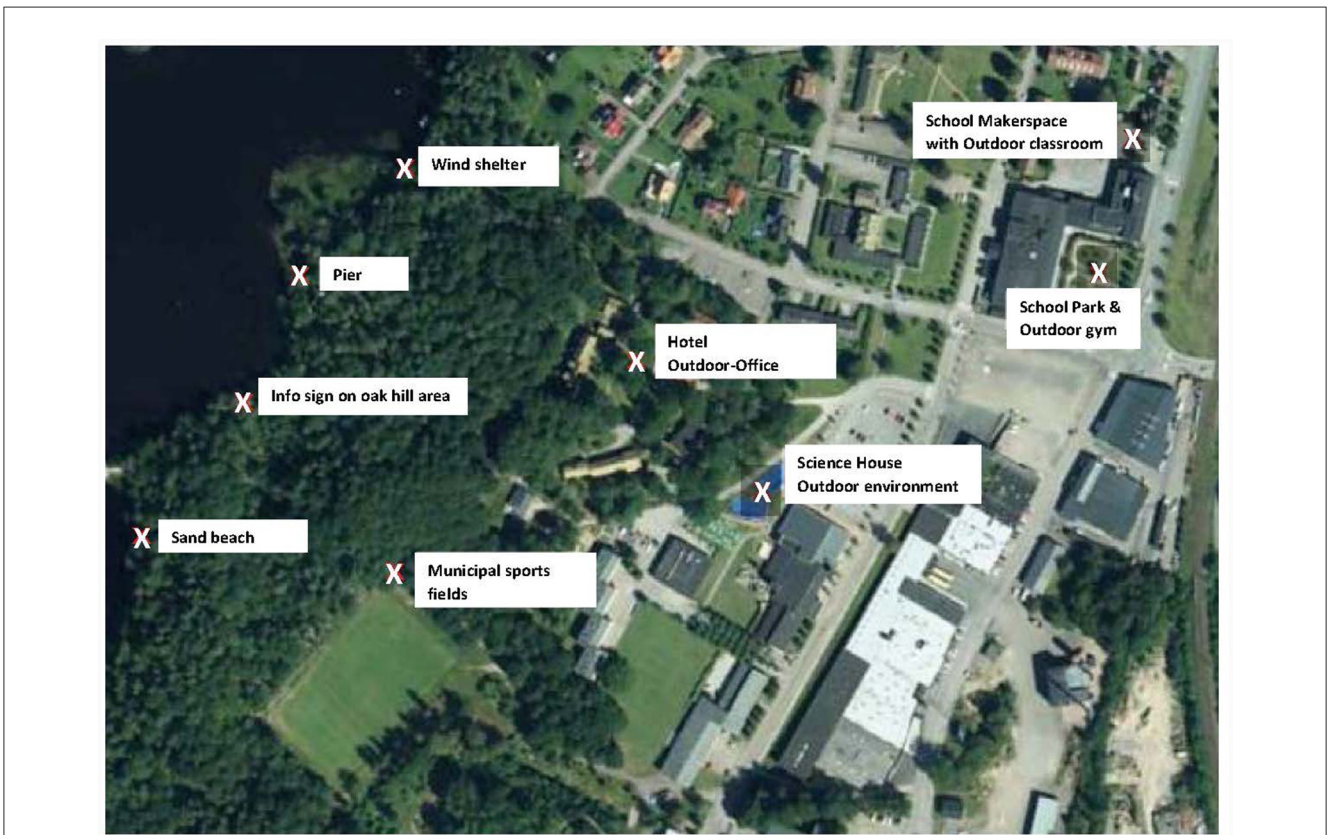


FIGURE 2 Potential outdoor office locations in the surroundings of the school which were evaluated with a QR-questionnaire (based on areal photo from Google maps, developed by the project coordinator).

workshops were conducted at the upper secondary school, in October 2022, in March 2023 and in April 2023. The object of the first and last of these workshops was to organize outdoor lessons at a large scale. The teachers were encouraged to relocate lessons to the outdoor environment. The head teacher compiled a schedule for the days. The research team together with the project coordinator followed particular classes to observe and have the opportunity to ask questions to students and teachers about their experiences of outdoor lessons and places. The workshop in March 2023 initiated a month with outdoor education as the theme. The students had an “inspirational lecture” and went into a competition between the classes where they would get points for various tasks. One such task, led by the research team, was to reorganize and adjust the local outdoor classroom to fit group work, using existing furniture and other materials. After each workshop, a group discussion was organized with teachers and the project coordinator in order to summarize and reflect over the progress of interventions and the process at large.

### 3.4 Questionnaires

Several types of questionnaires were distributed and made available for various groups of actors to answer during the project. Two of them concerned the overall process of the project and have been used for this paper.

A *questionnaire to the public* with focus on outdoor office work spaces and facilities in the area was reached through QR codes put on information signs at each setting. The settings included a temporary outdoor gym and an outdoor classroom by the school, areas outside the Science house and six other settings in a nearby area dominated by forest and a lake (by a shelter, a sandy beach, a hill of oaks, a pier and a sports field) (see [Figure 2](#)). The questionnaire contained a mix of open and multiple choice questions about (1) how the place was used (2) if it was wired for work or studies (3) possible improvements and (4) what meaning was associated with the site. Questionnaires were open from April 2022 to June 2023, but at times the signs with QR-codes were displaced and not available. The questionnaire to the public was answered totally 33 times.

A *project evaluation questionnaire* was distributed to evaluate the entirety of the project through a three step survey during the project time. Links to actors in the project were distributed through e-mail during May 2022, November 2022 and May 2023. Altogether 30 persons were targeted across local government, the upper secondary school, the Science house and local companies. Respondents at the second occasion were encouraged to distribute it to more teachers and students. The mix of open and multiple choice questions had items on (1) the respondents own role in the project (2) how the project was experienced to progress toward its goals (3) requirements for its further development and (4) own role ahead. The questionnaire was responded to by altogether 24 unique persons, with 11, 19, and 11 responses during each of the three occasions. Respondents included employees and students at the school, employees at the local government, actors in local companies and politicians.

The responses from the two questionnaires were compiled for each question, either qualitatively summarizing the content for an

item, or quantitatively with descriptive statistics describing how respondents had experienced or assessed outdoor places or project.

### 3.5 Interviews

Individual interviews were conducted at the end of May 2023 with three key actors related to the project: the project coordinator, the head teacher, and the project leader at the local government. The interview guide contained the following themes: (1) introduction to project and the interview with basic information about the interviewee and his/her role in the project, (2) results from the project, (3) the management of the project, (4) the process and governance of the project, (5) the project organization and decision-making, (6) power and relations in the project, (7) personal role and development. The interviews took 45–80 min each and were conducted online using Zoom and its recording function and transcribed verbatim through Windows 360, thereafter corrected.

## 4 Results

The project ran across 2 years and evolved into three partly overlapping phases, a *first phase* when the project was anchored among the local actors, a *second phase* when the prototypes were established, and a *third phase* when the project was evaluated, data analyzed, and knowledge and experiences from the project disseminated. The project chose an open, explorative approach to the introduction of outdoor working and study spaces, making use of prototyping while co-producing sites with adaptations to various work modes.

In *Phase 1* dialogues were initiated with various local actors and organizations in order to potentially involve these in the project. The local government, the Science house, the upper secondary school, and various local private stakeholders were invited. The project evolved in a steady but quite slow pace during this phase, with a large information flow required to convince, explain and illustrate the ideas, goals and opportunities. The project coordinator took the lead scoping what resources and capacities were available. In *phase 2* sites for the three prototypes for outdoor studies and work were established, formed and taken into use. Most activities and interventions took place during this phase. The project coordinator initiated a number of activities of which many also involved the research team extensively. The development of prototypes accelerated, including the shaping of a number of spaces and facilities. Various events were organized to stimulate the development and use of outdoor spaces for work and studies in the town. Primarily, the upper secondary school engaged in the process and the work concentrated to prototyping for outdoor studies in the surroundings of the school. The overall plans of local industry to engage in the project at a larger scale were gradually abandoned. In *Phase 3*, there were efforts to consolidate the ideas and the practice of outdoor education at the school and to contribute to the wider local process by organizing occasions for reflection with local stakeholders. The focus of the research team during this phase was to evaluate the project and its outcome.

## 4.1 Phase 1—anchoring the project

A first project meeting was set up to make all parties familiar with and dedicated to the project. A number of local actors and the research team gathered in the Science house to discuss the ideas, both in large and small groups. From the upper secondary school the headmaster, teachers and students from the student council participated, as did local managers of school buildings and other officials from departments of the local government, as well as some local companies and staff at the Science house (see Table 1). At this meeting the consultant, who had initiated the project, communicated goals, project activities and defined the format for knowledge co-production. The idea was to give all actors a chance to develop ownership of the project and define their roles within it. The notion from the original application of using prototypes in the development of outdoor office work and studies was a starting point. Walking environments, outdoor offices and maker spaces were discussed to serve the purposes of the project. The project coordinator channeled the work into discussions on how to realize prototypes for each type of setting and formed working groups with broad representation for this purpose. Overall, plans were adjusted as the process evolved, making the local upper secondary school the target for most ambitions and the Science house the venue for some of the events, but not much more. The original idea of involving local industry and other local partners was also only partly realized.

## 4.2 Phase 2—initiating activities, experiencing, and shaping prototypes

Initially, the internal communication at the school and within the local government took much of the project time. A kick off for the project was organized at the school with information from the project coordinator and the research team, followed by a discussion. After that the project coordinator organized a couple of meetings for teachers and student representatives to discuss how to get on with the project. The research team joined on video-link. These steps were important to secure resources and acceptance for the project at the school.

The main focus throughout the project, particularly during phase two, was the realization and testing of prototypes. Initially, the development of *outdoor work and study environments (outdoor offices)* took place in the schoolyard, with various seating opportunities identified and organized. This included creating an outdoor classroom, also defined as a *maker space*, in collaboration with students and teachers. These developments, located on parts of the car parking in the northern part of the schoolyard, included boxes and a former bathtub for urban gardening, tables in concrete and some moveable structures and frames. The outdoor classroom structure had a floor, a roof, a white board and contained moveable benches and tables. It evolved through the project with further additions of furniture, wind shelter and writing/laptop supports. A large wall painting was also created in the area in a collaboration between students and artists. On the southern side of the school an outdoor gym, sponsored by a company, was set up temporarily for some months. The prototype *walking environment* was applied to

the green-blue surroundings of the school with one route identified as particularly useful for outdoor lessons (see Figures 3, 4).

The first and last of the three workshops on outdoor lessons were planned in a collaboration between researchers, the head teacher and the project coordinator and involving students and staff at the school. The lessons organized were using the outdoor classroom/maker space, as well as other places in the surroundings of the school. The students had lessons in subjects such as English and physics outdoors. A class on photography included walks into the local forest. In a lesson on child-care they used tables, benches and some lawns with trees at the south side of the school building.

The thematic month during March-April 2023 added vitality to the process. At the second workshop many classes tested out the possibilities of forming settings adapted to their needs while studying outdoors, arranging and grouping furniture and other materials available. Teachers commented on the joyfulness expressed by students while carrying out this task. Also launched during this period, was a communication campaign with push-notes informing on the value of outdoor studies on screens across the school and in the facilities of the local government.

In addition, toward the end of the project-time some outdoor office prototypes were installed beyond the schoolyard. Two “tree-offices” out of wood were built and attached to trees in a local heritage park. They were later removed after locals having complained that they detracted from the overall essence of the cultural environment. After new leadership had taken over at the Science house some additional initiatives were taken. Their roof terrace was furnished for office work, portable kits for outdoor office work were made available to rent, and some benches with possibilities to charge digital gadgets were installed in the surroundings.

## 4.3 Phase 3—learning and knowledge dissemination

During the third and last phase, as experiences from the project were collected and analyzed, it became clear that the project as a whole had contributed to outdoor study places and practices, but less to the development of outdoor office work. The local upper secondary school had been responsive and got engaged in the project, while other actors had dropped off. Still, the final conference of the project revealed possibilities for change ahead with new actors as the Science house now engaged in outdoor office possibilities.

The answers from questionnaires and interviews evaluating the project revealed how its achievements were perceived differently by various actors, based on them having different insight and experiences from the process. In the beginning and end of the project time, goals were considered to be reached to a larger extent than midways, when evaluating to what extent the project contributed to the wellbeing, motivation, creativity and satisfaction of students and others in contact with the project and its places. Similar responses were given when evaluating the project's implications for other citizens. For the collaboration with work-life and industry in the small town, the motivation and goal



TABLE 1 Main actors and organizations with their professional role and type of engagement in the project specified.

Actor/organization	Professional role	Engagement in project
Project leader	Official at the department of industry at the local government with a background as planner.	Main applicant for the research project representing the municipality and responsible at the municipal level for the project's implementation and finalization.
Project coordinator	Landscape architect employed by the municipality as a project leader.	Coordinated and managed the project on site. Initiated, organized and facilitated communication between the different actors involved.
Consultant	Consultant in business development	Engaged by the municipality to facilitate the process across actors and domains.
Teacher with special responsibilities	Teacher in English and German with special assignment as head teacher, responsible for accessible learning environments.	Supported the process of building capacity for outdoor learning at the school. Became a contact person to teachers and students half-way into the study.
The upper secondary school with students, headmaster and teachers.	Offering educational programs in general subjects but also vocational training in plumbing, electricity.	Turned into the main site and actors for the project's prototyping process exploring opportunities for outdoor study environments and co-constructing knowledge.
The Science House	A local knowledge hub and venue having the aim to connect education, industry and entrepreneurial development in the municipality.	Targeted as an important collaborator in the project.
SLU—Swedish University of Agricultural Sciences	Research team with expertise in landscape architecture, environmental psychology, and urban planning.	An interdisciplinary research team engaged in initiating the project, taking part in its development and prototyping and responsible for evaluating the process (data collection, analysis, reporting, and dissemination).



FIGURE 3 Walking environment nearby the school (Left) and the outdoor classroom within the makerspace arena on the schoolyard (Right).

achievement were perceived as very high initially, but then lowered during the two coming evaluations (see Figure 5).

The respondents considered needs for improvement of the project along two different themes. One of them was how to better anchor, communicate and spread the project idea within the municipality and beyond. The other theme, mainly found among those connected to the school, included more concrete considerations related to how the outdoor classroom setting was equipped, placed, and maintained. Several described a wish to engage continuously in the project in order to further facilitate outdoor studies, coordinate, inspire, and spread information.

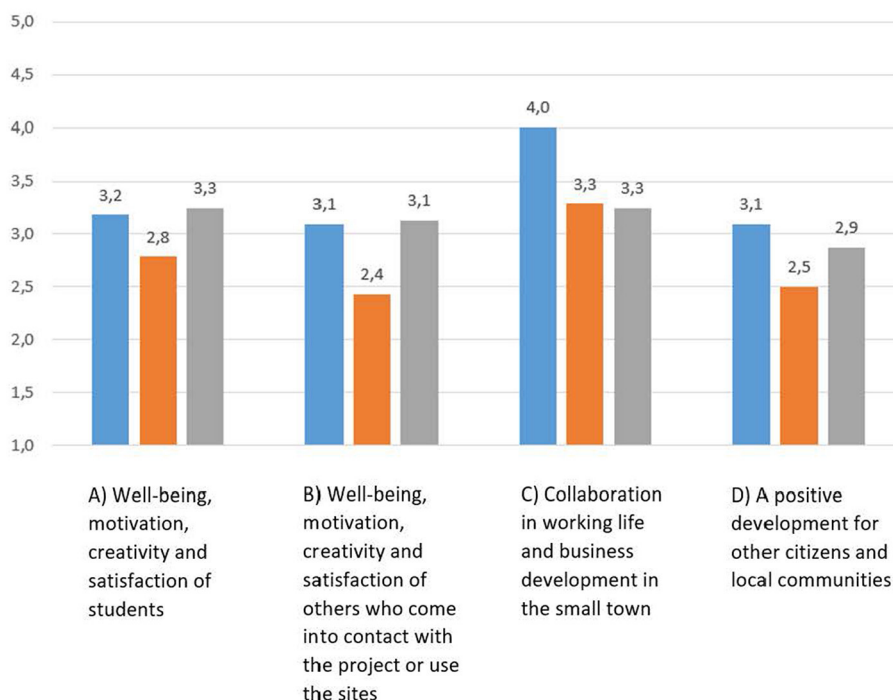
Others appeared less engaged and thought the project had not achieved much despite the many ideas.

The questionnaires to the public for evaluating settings for potential outdoor office work collected a number of ideas for improvements of these facilities. The respondents thought these could potentially help students, improve studies and be places for work outdoors, at least some hours per week. This indicates that the respondents saw possibilities for both studies and office work in the spaces. It was also mentioned how these facilities offered beautiful spaces and opportunities for experiencing nature. Improvements suggested were more information and inspiration



**FIGURE 4**  
Opening of the maker space on site at the schoolyard in April 2022: displaying the gardening initiatives, the wall painting and the outdoor classroom (Left) and the outdoor gym placed temporarily in the small park at the other side of the school building (Right).

How do you perceive that the project is on its way towards its goals of developing outdoor work and study spaces that promote:



**FIGURE 5**  
Evaluation of perceived progress of project goals developing outdoor work and study spaces. Comparing evaluation 1 (pillar blue left), evaluation 2 (pillar orange middle), and evaluation 3 (pillar gray right). Average weights 1–5 with 1 = low and 5 = high.

on outdoor office work, better technical support with chargers and projectors and more facilities such as walking trails, waste baskets, benches, chairs, tables, shelters, roofs, sport equipment, and overall improvement of the areas with focus on maintenance and cleanliness.

The interviews with three key persons revealed that they had very different perspectives on the project and its process,

with different ways of framing and experiencing it. The *project coordinator* was a landscape architect in the beginning of her career. Her focus was on the overall project and of getting visible change happen. She described many obstacles in taking the project forward. One was a repeated wish from the local government to get the prototypes in the schoolyard to look “nice,” before expanding the ideas to other places. This indicates a lack of shared goals



among different actors in the project. The process often got stuck due to a lack of support in finding practical solutions, such as for IT and open space maintenance. A dedicated working group, with time set off for the project and mandate to make decisions could have made a difference. Now, many actors only provided engagement in the process temporarily. However, the experience of the head teacher providing a more long-term commitment to the process was described as very supportive. With time, the focus of the project coordinator turned increasingly to the local upper secondary school as the primary arena for realizing the ideas, even if she stayed attentive to the potential of particular applications also having broader implications. The project coordinator also reflected over the need for a process like this to take time:

*“Somewhere in the back of their heads it has landed that there is a new way of working and a new way of thinking about the daily office work. [...] Then I think it might need to be heard more times for people to actually change their habits.”*

She also pointed out the potential in working with physical attributes, spaces and visualizations. She described how “things got started” when she “sat down and drew.” She saw challenges with the development of outdoor-offices but also strategies to overcome them and find ways forward for the idea:

*“I like it very much. I do. I am very inspired by it. So if you disregard the project’s results, which I may wish had been different, or had become more [expressed] in physical places, then I think really... If you manage to get a sufficient amount of people along, and also get this thinking from leaders, then I think you can create fully functional outdoor offices and outdoor classrooms where you can work at least as well as indoors. Then, there are challenges to solve, such as noise and bad weather, but then perhaps the indoor office is a complement, simply. So you can have both.”*

The belief in the idea of moving work outdoors was an important motivator, strengthened by the fact that there was ongoing research on the topic as well as an interest from actors outside the municipality. Sharing experiences with other similar projects at a conference was also supportive for the project coordinator.

The *head teacher* became dedicated to the idea of outdoor classes over time and claimed youth need to get outdoors to “get exercise.” She described her experience of the process evolving, initially from some distance and then more engaged as she took over some of the headmaster’s role in the project when becoming a head teacher. In the assigned school day routine, full of tasks and demands for teaching, the idea of going outside with the students generally did not get high priority. She described how it raised many questions among her colleagues to which the project appeared somewhat “abstract.” A few teachers were vocal and resistant to the ideas, while others were more positive. However, when the outdoor classroom took form at the schoolyard the process accelerated with more teachers starting to try it out, exploring its use during different weather conditions, and contributing to the development by adapting tasks, techniques and furnishing. Teacher meetings were also re-located to the outdoors.

The head teacher described how she had expanded her own explorations of outdoor education practice and started to collect and compile ideas on outdoor classrooms more systematically. She was trying out and evaluating experiences, and described it as a very subtle combination of practical issues and challenges to the role of a teacher:

*“I think we are very afraid of the steering [...] and of losing control.”*

The head teacher found herself in a position where she was communicating a lot, both with colleagues and students, the project coordinator and the research team. Many ideas were formed for how to make more use of the outdoors, now and in the future. She found that this process contributed to learning, both for herself and others.

The *project leader* with overall responsibility for the project had a third perspective, focusing on the role and effects of the project for the municipality at large and over time. He gave examples of how the ideas on outdoor office work and recreation disseminated as “ripples on the water” in conjunction with other collaboration. He drew parallels to a project on storm water management where local companies saw advantages and therefore wanted to finance the construction of a dam.

A prevailing idea was that local change in a small town depends on private actors, particularly industry, which in the case of outdoor offices had shown less interest in engaging on a more continuous basis. However, the project leader connected the project with work on the image and overall success of the municipality. In this perspective, the process was a learning experience reaching far beyond the modest interventions by the upper secondary school. He described how communicating the ideas behind the project with local businesses and officials had garnered support for the project, but also stressed how this type of process takes time, spanning several years. This could mean that the process of developing outdoor office spaces and practices in the municipality had only just begun. He pointed out how a budget for the outdoor environment can help a process forward and prevent people from thinking:

*“Oh so now that was just that project and then nothing more.”*

The challenges posed by a schoolyard dominated by cars were raised but not resolved during the project period. Suggested alternative usages of the schoolyard were cut short by overt resistance from some students, wanting to keep parking just next to the school. This hindered any more large-scale improvements of the schoolyard. However, the project leader pointed out the progress of even having discussions about the area’s uses and temporary changes:

*“I mean it was really a parking space which was very, very difficult to take over. There is a very tangible car-dependence [making the space] very, very hard to [...] take over.”*

All three interviewees pointed out the important role of social aspects in any process of implementing change. There was an

argument of people possibly being more reluctant to work with people they do not know in a small town. The project leader had already developed a local network, providing more simplicity in decision-making. As the coordinator lacked this, she asked for more formal structures of the local government to support the process. Both the coordinator and the head teacher described challenges in the process on many different levels, at large but also for example concerning the development and management of outdoor facilities, such as obtaining building permits, establishing outdoor table tennis, ensuring plants were watered and maintaining cleanliness.

After almost 2 years, the process finally did lead to implementations. The attribution of a teacher responsible for coordinating the work as part of her working tasks was a vital step in the process, boosting it and creating connections across stakeholders and to the research team. The hard work of the project coordinator to involve more actors showed results toward the end of the process with several ideas realized during the very last months. Reasons for this may include new leadership at the Science house and the fact that any local process of change requires substantial amounts of time. The type of complex change needed to develop outdoor offices and study spaces requires a reflexive process in its adaptation to local ideas and expectations, structural circumstances of sites as well as the weather conditions of the day and season.

## 5 Discussion

The approach of this study on moving indoor office tasks and studies outdoors was to use prototyping within an explorative co-production framework with feedback loops and learning processes integrated, allowing amendments for improvement over time. Also this paper aimed to be part of this learning loop. The results showed that this type of place-making, involving spatial changes, but also having implications for lifestyle and work-life, can be rather challenging to bring about. However, with dedicated time and involvement it can support the development of healthy lifestyles and everyday practices in school and work-life.

The project revealed both challenges and possibilities in the place-making process. Concrete designs and realized prototypes brought the process further, providing visible results, arenas for trying out outdoor work and studies, and possibilities for co-production. This can be valuable for the engagement and sense of place of the community (Ellery and Ellery, 2019). However, the process requires a balance between prototyping and a grass roots development of new everyday practices. The fact that project coordinator, project leader and research team all had affiliations with the architecture field was probably formative and contributed to the local government expecting a “neat design” of spaces. This confused the core idea of a prototyping supportive to an iterative process. The project missed possibilities for integrating users’ positive and negative experience in learning loops.

The integration of outdoor work into the social practices of working life requires substantial support of people in leading positions for ideas getting legitimacy and also for people setting aside time for the work. Petersson Troije et al. (2021, p. 1) described that “if working life is to benefit from outdoor office

work, leaders, urban planners and policymakers need to collaborate and show the way out.” In this study, we recognized a dip in people’s engagement midway, with more engagement again in the last phase. We recognized how the school became more explicit in taking responsibility for the project after some time, with the newly installed head teacher getting time set off to engage in the project. With this contact person to the larger collegium of teachers and other local actors, the decision-making became swifter and more well-informed. The three workshops taking the process forward at the school were clearly made possible due to the head teacher and her new role. Possibly, with some investment of time and effort, a similar process could develop within the industry and the Science house.

Traditional viewpoints among people in leading positions might hinder the development toward more time outdoors in both schools and workplaces. This may explain the lower engagement among some actors and a slow pace in the overall implementation of ideas beyond the school. Still, there are signs of seeds for change from the project. For sure, the well-established networks across school, industry and local government do have potential for complex developmental work across sectors in this local community.

Any project implementing change in people’s everyday lives requires careful adaptation to local contexts. We have studied a small town with low levels of urbanization, with plenty of access to green open spaces, and a mind-set which turned out to be rather resistant to change in spite of aiming for the vision of creating an attractive local environment. The case may be very different in other parts of the world, affecting how successful various approaches become. In this case there was an abundance of space available, built facilities and green infrastructure with attractive urban forest and lakes, and even an accessible trail system nearby. Swedish legislation also support the citizens’ use of local forest. On top of these quite common characteristics of small towns in Sweden, this particular municipality has a Science house containing advanced technology created for locals to appropriate. In the light of cities around the world getting more densified, the situation stresses the value of physical infrastructure to allow both place-making and health-supporting practices.

The process of moving office work outdoors can be complicated when habits and norms related to everyday chores in work life are not adapted, but people expect them to be carried out very much as before. In any development of creative work spaces there is always some resistance (Hoff, 2014). The idea of moving office work outdoors can be truly challenging to what people expect and conceive of as characterizing a good work environment (Petersson Troije et al., 2021), so it would be surprising if it went swiftly. The local school now made explicit an intention, visible for anyone in the small town visiting or passing by. This is a strength of using physical prototypes as they have a lasting imprint locally, supportive to memory and possibly nudging to new initiatives.

Recent intervention studies have shown that bringing office work outdoors is possible and appreciated by those testing it, while there are also many challenges (Petersson Troije et al., 2021; Smut Ud, 2023). Challenges include teachers having to figure out how to design and adapt tasks to outdoor learning. In educational contexts, a conglomerate of ideas from established discourses of outdoor

education may destabilize established norms and procedures in the professional practices of teachers (Fenwick et al., 2012). Possibly more place-based strategies, adapting tasks to the particular sites in a way which tend to encourage more playful interaction with place and peers, in line with the curriculum for younger school children (Mårtensson and Fägerstam, 2020), might be conceived as problematic in relation to curriculum for older school children. Also for office work, going outdoors might require some planning and selection of tasks among office workers (Smut Ud, 2023), possibly causing hinders.

The fact that the local school turned into an important arena for local place-making in this study, while other parties did not step up to the same extent, is in line with earlier studies on community development in rural settings (Nordström and Mårtensson, 2001). Findings by Akoumianaki-Ioannidou et al. (2016) and Jansson et al. (2018) show that many students, also in secondary school, do appreciate being outdoors and having green elements in their schoolyard, and associate this with the possibility to bring studies outdoors. Still, despite the outdoor education appearing to work well, the dispute around the car parking shows that there can be many obstacles of various types to overcome in order to reach change, including among students.

The study also shows that communication and dissemination in inter- and transdisciplinary projects need to consider language and format for sharing results and lessons learned. In this study on outdoor offices, landscape architecture, environmental psychology, health and education are all domains involved. The results describe the overall project and the process of explorative place-making of outdoor offices and studies, pointing out some challenges and opportunities in relation to earlier findings, in this young research domain. In order to evaluate the spatial configurations and social and educational practices developed, one also need to investigate how the students and teachers experienced settings and situations. However, practitioners in the municipalities who carry out the transformation to more outdoor office work and studies also need to get a chance to practice across domains in order to develop new capacities and routines, all demanding time, new roles and mandates.

## 6 Conclusions

A transdisciplinary approach involving the co-production of knowledge to investigate a local process intertwined with the development of outdoor environments in a small town, is inherently a challenging endeavor. This study confirms that good ideas and hard work are not enough, since any change in the organization and practice of everyday life needs legitimacy from several parties, as well as enough time set off to explore the new strategies. In addition to competing ideas of how the green surroundings are to be kept and made attractive, both work life and education bring a multitude of ideas and values regarding how things ought to be, to the place-making process. Prototyping of places and practices during place-making can create an arena for making such ideas visible, making it possible to scrutinize their reception. The lessons learned from this process contribute to research and development efforts aimed at transforming

land to support sustainable life-styles in urban, rural and peri-urban settings.

Following we list the main lessons learned from this explorative project, including the importance to:

- Take time to introduce the ideas which are to stimulate the process (as prototyping in this case).
- Ensure that individuals have the authority and time necessary to provide legitimacy and mobilize resources for the local process.
- Establish local networks to support long-term engagement which can remain active even after a project period.
- Consider carefully the amount, the language and format for sharing results and lessons learned during the process.
- Efficiently impact routines and habits by supporting changes that leave an imprint on both the physical environment and the social organization.
- Acknowledge how change takes place on different scales and at different paces among actors, dependent on their specific institutional context.
- Connect the local process to wider discourses in society on attractive liveable cities and sustainable development.

## 7 Future studies

The experiences from this study show the need for more research on the very practices of outdoor office work and the change-making and place-making processes required to make it happen at a larger scale. A transdisciplinary and multi-actor approach to developing knowledge in this field might be of particular value. The above lessons could be explored further and inform future studies, however adapted to their site specific development and anchoring. Iterative processes that build upon learning and re-learning, adaptation and improvement, may be of particular value. Overall, there is value in understanding the factors that hinder or support individuals in leadership or key positions, whether in schools, industry, or local government departments, from engaging in opportunities for change.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

Ethical approval was not required for the studies involving humans because the questionnaire questions were not in the scope of what demands ethical approval. No sensitive issues or vulnerable groups were targeted. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and institutional requirements because the field work was an integrated part of the students schooling with teachers heading all sessions.



## Author contributions

MJ: Writing—original draft, Writing—review & editing. FM: Writing—original draft, Writing—review & editing. NV: Writing—original draft, Writing—review & editing.

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## References

- Akoumianaki-Ioannidou, A., Paraskevopoulou, A., and Tachou, V. (2016). School grounds as a resource of green space to increase child-plant contact. *Urb. For. Urb. Green*. 20:9. doi: 10.1016/j.ufug.2016.10.009
- Bringslimark, T., Hartig, T., and Patil, G. G. (2007). Psychological benefits of indoor plants in workplaces: putting experimental results into context. *HortSci. Horts* 42, 581–587. doi: 10.21273/HORTSCI.42.3.581
- Chawla, L. (2015). Benefits of nature contact for children. *J. Plan. Literat.* 30, 433–452. doi: 10.1177/0885412215595441
- Collishaw, S. (2015). Annual Research Review: secular trends in child and adolescent mental health. *J. Child Psychol. Psychiatr.* 56, 370–393. doi: 10.1111/jcpp.12372
- Courtney, P., and Errington, A. (2000). The role of small towns in the local economy and some implications for development policy. *Local Econ.* 15, 280–301. doi: 10.1080/026909400750068013
- Ellery, P. J., and Ellery, J. (2019). Strengthening community sense of place through placemaking. *Urb. Plan.* 4, 237–248. doi: 10.17645/up.v4i2.2004
- Fägerstam, E. (2011). *Space and place: perspectives on outdoor teaching and learning* (Doctoral dissertation). Linköping University, Linköping, Sweden. Available online at: <https://liu.diva-portal.org/smash/get/diva2:551531/FULLTEXT01.pdf>
- Fägerstam, E. (2013). High school teachers' experience of the educational potential of outdoor teaching and learning. *J. Advent. Educ. Outdoor Learn.* 2013:769887. doi: 10.1080/14729679.2013.769887
- Fenwick, T., Nerland, M., and Jensen, K. (2012). Sociomaterial approaches to conceptualising professional learning and practice. *J. Educ. Work* 25, 1–13. doi: 10.1080/13639080.2012.644901
- Frumkin, H., Bratman, G. N., Breslow, S. J., Cochran, B., Kahn Jr, P. H., Lawler, J. J., et al. (2017). Nature contact and human health: a research agenda. *Environ. Health Perspect.* 2017:1663. doi: 10.1289/EHP1663
- Gilchrist, K., Brown, C., and Montarzino, A. (2015). Workplace settings and well-being: greenspace use and views contribute to employee well-being at peri-urban business sites. *Landsc. Urban Plan* 138, 32–40. doi: 10.1016/j.landurbplan.2015.02.004
- Hoff, E. (2014). "The creative place," in *Creativity Research: An Inter-Disciplinary and Multi-Disciplinary Research Handbook, 1st Edn*, ed. E. Shiu (London: Routledge), 12.
- Hu, X., Liu, X., Li, J., and Jiang, B. (2022). Creating restorative nearby green spaces for knowledge workers: theoretical mechanisms, site evaluation criteria, and design guidelines. *Landsc. Archit. Front.* 10, 9–35. doi: 10.15302/J-LAF-1-020063
- Hyvönen, K., Törmroos, K., Salonen, K., Korpela, K., Feldt, T., and Kinnunen, U. (2018). Profiles of nature exposure and outdoor activities associated with occupational well-being among employees. *Front. Psychol.* 9:754. doi: 10.3389/fpsyg.2018.00754
- Jansson, M., Abdulah, M., and Eriksson, A. (2018). Secondary school students' perspectives and use of three school grounds of varying size, content and design. *Urb. For. Urb. Green*. 30, 115–123. doi: 10.1016/j.ufug.2018.01.015
- Jansson, M., Vogel, N., Fors, H., and Randrup, T. (2019). The governance of landscape management: new approaches to urban open space development. *Landsc. Res.* 44, 952–965. doi: 10.1080/01426397.2018.1536199
- Kaplan, S. (1995). The restorative benefits of nature: toward an integrative framework. *J. Environ. Psychol.* 15, 169–182. doi: 10.1016/0272-4944(95)90001-2
- Kossek, E. E., and Lautsch, B. A. (2018). Work-life flexibility for whom? Occupational status and work-life inequality in upper, middle, and lower level jobs. *Acad. Manag. Ann.* 12, 5–36. doi: 10.5465/annals.2016.0059
- Kuo, M., Barnes, M., and Jordan, C. (2019). Editorial: The natural world as a resource for learning and development: from schoolyards to wilderness. *Front. Psychol.* 10:1763. doi: 10.3389/fpsyg.2019.01763
- Lottrup, L., Grahn, P., and Stigsdotter, U. (2013). U.K. Workplace greenery and perceived level of stress: benefits of access to a green outdoor environment at the workplace. *Landsc. Urban Plan.* 110, 5–11. doi: 10.1016/j.landurbplan.2012.09.002
- Lygum, V. L., Dupret, K., Bentsen, P., Djernis, D., Grangaard, S., Ladegaard, Y., et al. (2023). Greenspace as workplace: benefits, challenges and essentialities in the physical environment. *Int. J. Environ. Res. Public Health* 20:6689. doi: 10.3390/ijerph20176689
- Mårtensson, F., Boldemann, C., Söderström, M., Blennow, M., Englund, J.-E., and Grahn, P. (2009). Outdoor environmental assessment of attention promoting settings for preschool children—part of salutogenic concept. *Health Place* 15, 1149–1157. doi: 10.1016/j.healthplace.2009.07.002
- Mårtensson, F., and Fägerstam, E. (2020). *Platsens roll vid lektion på skolgård, [The Role of Place During Lesson at a Schoolyard]*, Movium Report. Uppsala: Swedish University of Agricultural Sciences.
- Mårtensson, F., Jansson, M., Johansson, M., Raustorp, A., Kylin, M., and Boldemann, C. (2014). The role of greenery for physical activity play at school grounds. *Urban For. Urban Green* 13, 103–113. doi: 10.1016/j.ufug.2013.10.003
- Mygind, L., Kurtzhals, M., Nowell, C., Melby, P. S., Stevenson, M. P., Nieuwenhuijsen, M., et al. (2021). Landscapes of becoming social: a systematic review of evidence for associations and pathways between interactions with

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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nature and socioemotional development in children. *Environ. Int.* 146:106238. doi: 10.1016/j.envint.2020.106238

Nordström, M., and Mårtensson, F. (2001). *Att bo på landet är olika: En miljöpsykologisk studie av hur landsbygdsbor ser på boendemiljö och byliv, [Living in the countryside], Department of landscape planning, Swedish University of Agricultural Science, Report 01:04.* Lisberg: Petersson Troije C.

Pagels, P., Raustorp, A., Ponce De Leon, A., Mårtensson, F., Kylin, M., and Boldemann, C. (2014). A repeated measurement study investigating the impact of school outdoor environment upon physical activity across ages and seasons in Swedish second, fifth and eighth graders. *BMC Publ. Health* 14:803. doi: 10.1186/1471-2458-14-803

Petersson Troije, C., Lisberg Jensen, E., Stenfors, C., Bodin Danielsson, C., Hoff, E., Mårtensson, F., et al. (2021). Outdoor office work—an interactive research project showing the way out. *Front. Psychol.* 12:636091. doi: 10.3389/fpsyg.2021.636091

Remmen, K. B., and Iversen, E. (2023). A scoping review of research on school-based outdoor education in the Nordic countries. *J. Advent. Educ. Outdoor Learn.* 23, 433–451. doi: 10.1080/14729679.2022.2027796

Rönnlund, M. (2020). “I love this place, but i won’t stay”: identification with place and imagined spatial futures among youth living in rural areas in Sweden. *Young* 28, 123–137. doi: 10.1177/1103308818823818

Sandell, K., and Öhman, J. (2010). Educational potentials of encounters with nature: reflections from a Swedish outdoor perspective. *Environ. Educ. Res.* 16, 113–132. doi: 10.1080/13504620903504065

Smut Ud (2023). *Lad arbejdslivet gro i det fri [Let Work Life Flourish in the Outdoors]*. Available online at: <https://smutud.dk/> (accessed September 28, 2023).

Soga, M., and Gaston, K. J. (2016). Extinction of experience: the loss of human-nature interactions. *Front. Ecol. Environ.* 4, 94–101. doi: 10.1002/fee.1225

Wahlberg, O. (2016). Small town centre attractiveness: evidence from Sweden. *Int. J. Retail Distribut. Manag.* 44, 465–488. doi: 10.1108/IJRDM-08-2014-0121

Wales, M., Mårtensson, F., Hoff, E., and Jansson, M. (2022). Elevating the role of the outdoor environment for adolescent wellbeing in everyday life. *Front. Psychol.* 13:774592. doi: 10.3389/fpsyg.2022.774592

Wolfram, M., Borgström, S., and Farrelly, M. (2019). Urban transformative capacity: from concept to practice. *Ambio* 48, 437–448. doi: 10.1007/s13280-019-01169-y