

Article

“Building Roots”—Developing Agency, Competence, and a Sense of Belonging through Education outside the Classroom

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Abstract: This study investigates how Education Outside the Classroom (EOtC) was used to support the students’ basic psychological needs, i.e., their need for competence, autonomy, and relatedness as described in Self-Determination Theory (SDT). The framework of Ecological Psychology (EP) was applied to explicate how the EOtC teaching settings helped the students to become effective, agentic, and connected. The findings show that this process was driven by their active engagement with environmental affordances which facilitated embodied experiences. Moreover, the interplay with place and people specifically reinforced their satisfaction of relatedness and created a deepened sense of belonging to their community. It is concluded that in order to foster the children’s healthy psychological and physiological development in EOtC, teachers should make use of the affordances and invitations of specific places as a starting point for their teaching to support the students to develop agency, competence and sense of belonging.

Keywords: education outside the classroom; self-determination theory; ecological psychology; affordances; agency



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1. Introduction

1.1. Education Outside the Classroom

In an increasingly complex world, there is a need to find new ways in education to support children to develop agency, competence, and a sense of belonging which are seen as fundamental universal motives for human flourishing. Ryan and Deci define flourishing as individuals who become “motivated, vital, resourceful, and fully functioning adults” [1].

In recent years, the experiential teaching approach Education Outside the Classroom (EOtC) has gained influence as an alternative way of teaching [2] that has the potential to promote student well-being and motivation [3,4]. EOtC can broadly be defined as relocating standard curriculum teaching to places outside the school building, such as forests, parks, school gardens or museums, for a single or a few days per week; it is used as a supplement to indoor classroom teaching [5,6] and affords enriched, experiential, and situational learning [7–9].

EOtC research so far had a strong focus on students’ physical activity (PA) and shows that children at the age between 7 and 13 years are physically more active [10–13] during EOtC sessions and that EOtC has significant effects on their health and well-being [14–16]. In this context, two major theories, stress reduction/recovery theory (SRT) [17] and attention restoration theory (ART) [18], are used to explain the restorative qualities of nature in EOtC. While SRT argues that contact with nature reduces stress and negative affect, ART claims that immersive experiences in nature restore cognitive abilities. Both make use of a biophilia argument that humans evolved in natural environments and therefore function best in natural surroundings.

It has further been reported for this age group that EOtC fosters students’ social relations [19,20], pro-social behavior [21], levels of participation [7], and inclusion, the latter especially for students with immigrant backgrounds [22]. Moreover, EOtC also provides

the opportunity to strengthen student–teacher relationships [23] and increases learning motivation [24,25]. In a study by Szczytko, Carrier and Stevenson [26], teachers stated that students with reported emotional, cognitive, and behavioral disabilities had significantly improved attention spans and decreased disruptive behaviors when learning outdoors. In their conceptual analysis, Barrable and Arvanitis [27] explicitly link EOtC and SDT and propose that the fulfillment of the three basic psychological needs leads to a flourishing human life.

1.2. Self-Determination Theory

Self-Determination Theory (SDT) is one of the most referenced theories in EOtC research and describes motivational behavior in terms of psychological well-being [1]. In SDT, the students' learning motivation depends on the satisfaction of so-called basic psychological needs. Deci and Vansteenkiste [28] describe the students' need for *competence*, *autonomy*, and *relatedness* as “universal necessities” which are “not learned but are an inherent aspect of human nature and thus operate across gender, across culture, and across time” (p. 25). In reference to White [29], they define the need for *competence* as people's desire to be effective and to experience mastery in dealing with their environment. The need for *autonomy* refers to people's universal urge to become self-regulated, to experience freedom of choice, and to act in accord with their interests and values. The need for *relatedness* expresses the human desire to be socially connected and to experience feelings of care and belonging.

In the school context, this means that in order to facilitate more self-determined learning, these three basic human needs should be promoted to enable the students to feel effective, agentic, and connected while they are confronted with new ideas and learning content [30]. From school research, it is well known that students learn better if they are comfortable, confident, and enjoy what they are doing [31], which in turn leads to higher motivation. Hereby, the concept of situational interest, i.e., interest that arises spontaneously [32] and builds on novelty, challenge, attention demand, exploration intention, and instant enjoyment [33], becomes vital. Toward these ends, teachers play important roles, as they are actively responsible for the creation of school environments that support these basic psychological needs [34], for example through the provision of appropriate structure [35].

Since the proportion of the world's population living in urban areas is growing annually, people are affected by reduced contact with nature. There is an abundance of literature that attributes this with negative effects on human well-being and functioning [36]. Recently, Ryan and Deci [1] suggested that time spent in nature may make an important contribution because it promotes intrinsic motivation; catalyzes a sense of vitality and well-being; and encourages positive social relations, prosocial tendencies, and community cohesion [37,38]. Hereby, SDT refers to the capabilities approach to development as advocated by Sen [39] and Nussbaum [40] since both, SDT and the capabilities approaches, go back to Aristotle's eudemonic view of happiness and emphasize the importance of autonomy, or free choice in action as a basis for a flourishing human life [41]. Empirically, it has been shown that SDT's basic needs partially mediate the relation between capabilities and indicators of wellness [42], by “facilitating need satisfaction—that is, experiences of autonomy, competence, and relatedness—and by preventing the frustration of these needs” [1].

1.3. Ecological Psychology

This alignment of SDT with the capabilities approach also links SDT and Ecological Psychology (EP), which becomes apparent in the role that the concepts of competence and relatedness have in each theory. Ecological Psychology, grounded in the pioneering work of James J. Gibson, advances a fundamental ontological proposition, which asserts a profound and direct interconnection between organisms and their environment in the complex process of perception. In EP, meaningful action possibilities of environmental features are

called “affordances” [43,44]. Recently, it has been suggested that the affordances need to be complemented by the concept of “invitations”. While affordances capture the ecological facts of a situation and determine the appropriateness of displayed behavior, invitations explain the behavior and capture “what the world does to the agent, what affective behavior it solicits, in whatever way” [45]. Hereby, the concept of *transaction* is significant as it highlights “people’s relations with physical artefacts, plants, animals, other humans, and features of the landscape” [46]. This transactional perspective underscores that cognition and behavior emerge from this embedded relationship, emphasizing the inseparable connection between an individual and their ecological context [47]. Within this transactional process, agents can relate to places and people and develop a sense of belonging.

The goal of EP is to explore the relationship between qualities of everyday environments and psychological well-being [48]. According to Chawla, time spent in nature is vital for children since a transactional relationship with nature is understood as “an essential dimension of a fully realized human life” [49] and enables them to develop competence and agency. Hereby, the children’s development is promoted by embodied engagement with environmental affordances [50], which are site specific. Flat, relatively smooth surfaces for example afford for “walking, running, cycling, skating, or skateboarding”, while relatively smooth slopes afford for “coasting down, rolling, sliding, or rolling objects down” [51]. With growing motor skills, children then discover new opportunities for movement and thus new affordances [52] and build the “capacity to understand and shape their everyday environment” [53].

Another aspect of EP is the importance of children’s participation in communities which promotes opportunities for the students “to exercise control over values spheres of life” [53] and to build a connection to their immediate surroundings. This also connects EP with Place-Based Education (PBE) as both approaches emphasize the use of the local community and environment as a starting point for learning [54]. Establishing a relationship to local places and people “helps students [to] develop stronger ties to their community, enhances students’ appreciation for the natural world, and creates a heightened commitment to serving as active contributing citizens” [55]. This relationship with nature and other people further explains how these experiences affect the students’ general well-being [49], which links Ecological Psychology and Self-Determination Theory with Education Outside the Classroom.

There are several studies in EOtC research that have used SDT as a theoretical frame to investigate student motivation and basic needs satisfaction as an outcome of EOtC [56,57]. Most of these studies focus on teachers’ perspectives. The few studies on the children’s views are mainly quantitative, and there have so far been no studies that investigate empirically the mechanisms that explain the effects on students’ motivation as a consequence of their participation in EOtC. There is a gap in the literature concerning a deeper understanding how these effects can be explained. This study’s main hypothesis is that in EOtC, the affordances and invitations of the teaching arenas are especially prone to support the students’ experience of psychological needs satisfaction, and their development of agency, competence, and a sense of belonging.

2. Material and Methods

2.1. Ethnographic Case Study

As it was important for me to obtain in-depth information about EOtC in a real-life setting [58], I chose an ethnographic approach and followed two school classes for a whole school year whenever they had EOtC [59]. As a subject area, ethnography developed from the disciplines ethnology and sociology of the early 20th century and was primarily interested in the question of ‘what is going on out there?’ with the aim to describe foreign worlds. Ethnography is characterized by (1) its subject matter, i.e., social practices, (2) a prolonged stay in the research field applying participatory observation, using a plurality / combination of methods, and (3) documentation [60]. It was one of the first qualitative techniques that

was adapted for school studies [61]—and since the 1980s, it has been extensively used in the field of educational research and also specifically in EOtC research [4,56].

2.2. Participants/the Field

The elementary school in this investigation was located in a small village in a rural part of Southern Germany. The school consisted of about 80 students from grade one to four with one class per grade level and had recently implemented EOtC as part of their school profile.

The convenience sample [62] was defined from the start, as I had been asked by the headmistress to conduct this research project with two classes (second and third grade) whose teachers wanted to be part of the project. The students (between age seven and nine) from both classes were predominantly from local families of rather high socio-economic status, among whom were five children with immigrant backgrounds and one child with Down Syndrome who was accompanied by a school assistant. In addition, three teachers participated in this study, the class teacher for the second grade, the science and physical education (PE) teacher for the third grade and the headmistress, who was also the PE teacher for the second grade.

Because I was involved over two previous years in assisting to establish EOtC at that school, I was therefore already familiar with most of the staff and the existing school culture.

2.3. Ethical Considerations

Approval for this study was granted by the German district's school authority and the Norwegian Agency for Shared Services in Education and Research (SIKT-500199). Teachers and the author attended an informative school meeting with the parents where the project was presented, questions answered, and consent forms with multiple method choices (observation, interview, photos) were provided, ensuring anonymity and voluntary participation with the option to withdraw without repercussions at any stage in the project. It is acknowledged that researchers have a unique responsibility when working with children, especially with respect of safeguarding privacy, and ensuring emotional well-being. These concerns were addressed by accompanying the children throughout the whole school year to develop a trusting relationship.

2.4. Data Collection

2.4.1. Ethnographic Fieldwork

One important source of information was 27 days of participatory observation during the school visits and a 3-day field trip to the Alps. Even though the definition of EOtC used in this project is rather broad and encompasses more than 'only' natural environments, an element of nature was present in 26 of the observed EOtC sessions (cf. Table A1 for details). I followed the two school classes and their respective teachers whenever they left the school building for their EOtC sessions and sometimes also when they had "normal" schooling inside. The purpose of the latter was to assess whether the students behaved differently in the school as compared to what had been observed in EOtC. During the participatory observation, I took hand-written fieldnotes (jottings) that consisted of brief descriptions, abbreviations, and symbols which I later transcribed and expanded into observation memos that captured my initial impressions, key events, conversations, emerging patterns and their exceptions [60,63].

2.4.2. Regular Debriefings with the Teachers

A primary incentive for participation of the teachers was the provision of feedback on their EOtC practice. To do so, I held regular meetings with the staff after every EOtC session. During those more informal conversations, important background information was given by the teachers that again served to deepen the understanding of the observations. I wrote minutes of those meetings and included them into my observation memos [64].

2.4.3. Semi-Structured Interviews with Teachers at the End of the School Year

I also conducted three individual semi-structured interviews towards the end of the school year to give each teacher an opportunity to reflect on their EOtC practice and talk about significant experiences. Questions included pedagogical goals connected with EOtC, observations on social relations, and the students' learning. As time for communication during ordinary school days was usually short, those in-depth individual interviews also gave me the opportunity to learn more about the teachers' experiences throughout the school year and their motives to engage in EOtC. It also helped to fill in some information gaps with no time pressure in a relaxed atmosphere away from school [65]. The interviews lasted between 42 and 52 min.

2.4.4. Guided Interviews with Students at the End of the School Year

After having observed the students over one whole school year, I also wanted to give them a chance to voice their own reflections about their EOtC experiences. Questions included what they remembered best from the previous year of EOtC, what they liked or did not like about it, and also covered some questions on social relations. Due to time restrictions imposed by school routine I was unfortunately not able to interview every single child but after consultation with the teachers [66]. I conducted interviews with 23 individual children, each for eight to ten minutes. I selected the children according to gender, ethnic background and how visible/noticeable they had been during my observations, choosing both those who had been very noticeable and those who had not attracted much initial attention. Participation in these interviews was voluntary. By then, I had developed a trusting relationship with the children and had the impression that they felt quite relaxed talking with me and also seized the opportunity to ask me questions about my research or myself in return. Where any sensitive data that arose or if the children started to talk about fellow students or other "third parties", it was omitted for publication. After individual consent of each student and their parents, these interviews were tape recorded and afterwards transcribed verbatim for analysis [67].

2.4.5. Two Expert Rounds

To mitigate observation bias and to handle questions of unbalanced power relationships between myself as a researcher and the participants in the field [68], I conducted two debriefing rounds during the school year with a group of EOtC experts who were not personally involved with the project. Prior to the meetings, excerpts from the observation memos together with some questions or problems that arose during field work had been sent to the group and then been discussed in detail upon meeting in person. Directly after the meetings, I wrote summary minutes. This feedback helped me to review my own material and my procedure from a different perspective [69,70]. Furthermore, I stayed in email contact with them during the whole time, asking for advice whenever questions arose. Analysis of fieldnotes and interviews

During data collection, after each day of observation, an initial interpretation of the data was already performed while transcribing the field notes into the observation memos. I again reflected upon these interpretations when preparing for the expert rounds from which I received further insights and sometimes indications towards other possible understandings of my material. Furthermore, the repeated discussions with some of my colleagues and with the teachers influenced understanding and further collection of the data.

The systematic post hoc analysis started with reading through all the material to obtain a sense of its entirety. Thematic content analysis [71] was applied, first generating 25 initial codes from the data, such as "structure and rituals", "freedom", "hands-on activities", or "bodily/sensory experiences", which were then subsumed into eleven themes. To structure the material, the themes were deductively associated with the guiding theories, SDT and EP. Hereby, three themes (experience of self-efficacy, autonomy, and relatedness and building connections) were coded under SDT, three themes (qualities of the outdoors, affordances of

the outdoors, and embodied experiences) under EP—although in the actual EOtC situations, these themes interacted and overlapped. In a next step, situations were identified which were dominated by themes that were related to both SDT and EP. Whenever the remaining five themes (joy, role of the teacher, gender aspects, barriers, and impact on everyday life) were present in those situations, they were used to provide yet another layer of explanation. See Table 1 for an overview of codes and themes and Figure 1 for a detailed depiction of the research design and the analytical approaches.

Table 1. Codes used to classify stereotypical situations that show how EP is related to the basic psychological needs in SDT.

Stereotypical Situation	Codes	EP-Related Themes	Basic Psychological Need	Difficulties and Barriers
Assisting student learning and well-being through hands-on activities that enable them to show different sides of themselves.	role of the teacher showing different sides of oneself		Competence	unsuitable group constellations teachers' insecurities, unfamiliarity with places and people, and lack of interest
Assisting student learning and well-being through providing safety and structure (rules, rituals, precise instructions).	hands-on activities physical activity bodily/sensory experiences structure and rituals			difficult to maintain control of and communication with class over a larger area rituals need practice (time consuming) students are more easily distracted outside
Assisting student-learning and well-being through providing opportunities for freedom, discoveries, and choices.	physical activity freedom curiosity relation to everyday life		Autonomy	finding the right balance between freedom and control great responsibility for student safety less control over learning outcomes due to the rich and sometimes unpredictable qualities of the outdoors
Assisting student-learning and well-being through relevance to everyday life.	role of the teacher flow joy	qualities of the outdoors affordances of the outdoors embodied experiences		
Assisting students' well-being through fostering peer connections.	social aspects physical activity freedom fresh air		Relatedness	social structures from inside are reinforced outside without teacher-intervention building new peer connections takes time
Assisting students' well-being through strengthening student-teacher connection.	hands-on activities role of the teacher place and people sharing experiences with the family			
Assisting students' well-being through establishing connections to place and community.	showing different sides of oneself friends students' reflections on teachers			teachers' insecurities, unfamiliarity with places and people, and lack of interest
Assisting students' well-being through aesthetic and restorative qualities of the outdoors.	physical activity freedom fresh air noise aesthetic experiences curiosity bodily/sensory experiences		Nature	finding the "right" place disturbances need to be addressed immediately
Assisting students' well-being through immersive qualities of the outdoors.	hands-on activities role of the teacher place and people flow joy lasting memories			

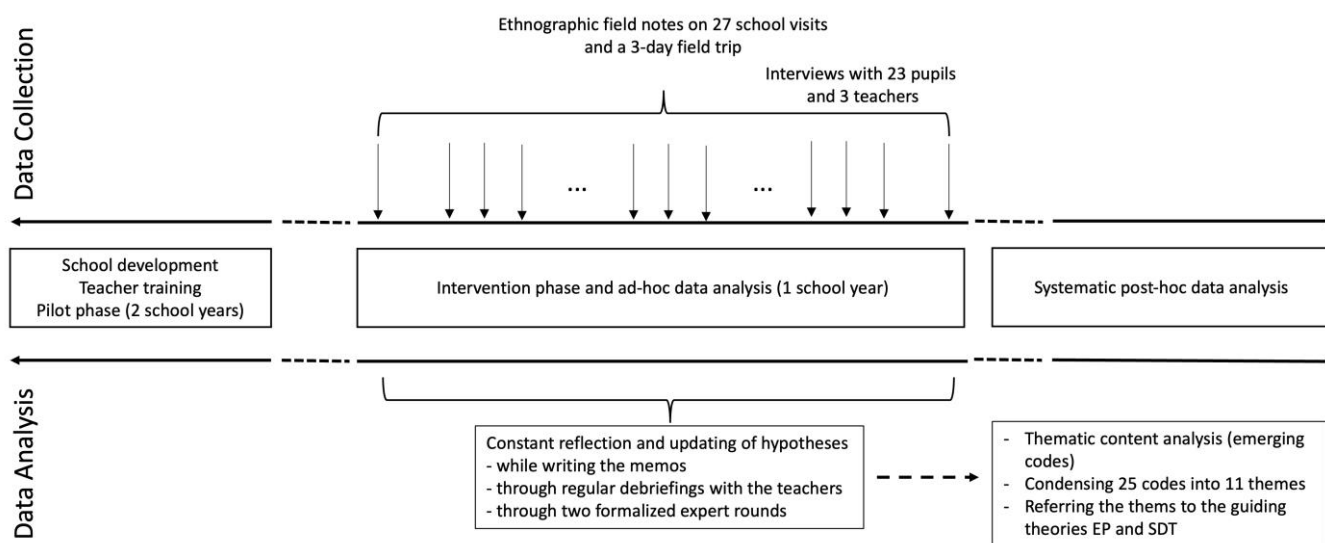


Figure 1. Study design with data collection and analysis strategies.

3. Results

3.1. The Need for Competence: To Feel Effective

“The interest of the children alone/they were totally involved in the topic, right from the beginning when we marched in there [into an art exhibition at the local museum] in a spiral, and I told them a few facts/but also later, when we broke up into groups/and the children lay on the floor all over the museum and somehow drew something according to Hundertwasser, and you really noticed that they had totally understood what the artist wanted to express, in his entire life actually/what he wanted to say, they got that and somehow wrote it down or painted it in their notebooks” (class teacher, 2nd grade). (The symbol “/” signifies a noticeable pause in the speech flow. Ellipses “(…)” are used to express an omission. Words in brackets “[]” are added by the author to make the quote more readable.)

In the following two sections, I will show how the codes “role of the teacher”, “hands-on activities”, “physical activity”, “showing different sides of oneself”, “bodily/sensory experiences”, and “structures and rituals” can explain the satisfaction of the students’ need to feel effective (see Table 1).

3.1.1. Assistance and Support

My findings illustrate that the teachers had a strong influence on the students as role models: if a teacher from my study showed signs of insecurity or lack of interest, this had an immediate impact on the students’ behavior and involvement. On the other hand, when they were enthusiastic and attentive, this was usually mirrored by the students.

Another aspect of the importance of the teachers’ role for the students’ experience of competence was mentioned by one of the teachers during the interview. She appreciated that EOtC gave students who often underperformed in the classroom a possibility to shine:

“well, sometimes the ‘strong’ students who do everything with ease in class may not shine in EOtC and erm/maybe that’s not really their thing/but that the ‘weak’ students who actually/in class/have a lot of experiences of failure, then when [they are] outside and (uhh) [are] digging for potatoes or something (. . .); well, they simply have a completely different task/or they are challenged in a completely different way and also have a sense of achievement” (class teacher, 2nd grade).

These often more physical, hands-on activities in EOtC seemed to support the children’s feeling of agency and self-efficacy. To illustrate the power of such embodied experiences, another teacher described a lesson about the topic of speed which she claimed to be

a rather complicated concept: *“for some of them [the students] it is simply not understandable to grasp the topic of speed in a closed room”* and so she decided to teach this outside:

“We went to ‘Nussallee’ [an alley close to the school with many chestnut trees], we estimated the [length of the] alley, we measured how long it is, and walked along Nussallee once and measured the time [this took] and measured it [again] once while jogging and once at full speed. And then we went back to school and then calculated it, the speed, as it had been in each case. And after the unit, all the kids knew what speed is. Because they experienced it themselves with their own bodies and this was then also reflected in the written tests afterwards/the [positive] results simply reflected that this really was the case, that it wasn’t just a guess on my part” (head mistress).

3.1.2. Providing Structure

A further aspect to support the students’ experiences of competence according to SDT is the provision of structure. In the EOtC setting, special attention needs to be paid to safety issues and risk management. As the teaching spaces in EOtC were often spread over a larger area, it was more difficult for the teachers to observe the learning processes and what was going on within each group.

My observations show that it was important to regularly clarify and practice the rules of conduct and that it proved to be very helpful when the EOtC sessions were rhythmized with a structured beginning and ending to create a familiar and safe frame outside of the school building. The teachers in my case achieved this by first collecting all the students in front of the school building where they then checked them for clothing and gear and gave a brief overview of the coming activity, reminded them of the rules that applied outdoors, and answered emerging questions. At the end of the school day, the students gathered again at the same place where the teachers recapitulated the day, listed once more what they had learned during today’s EOtC session and closed the activity with an official ending ritual. Moreover, the children themselves were also given responsibility to maintain structure by taking on “services” during the outdoor lessons, i.e., the ‘orientering team’ that was responsible for finding the way, the ‘safety team’ that needed to make sure that no one got lost or did something dangerous like climbing too high, and the ‘medical team’ that was carrying the first aid kit and provided first aid when necessary.

Furthermore, the teachers also had to give very precise instructions for the EOtC assignments and bear in mind that some of the teaching material from inside might not be suitable outdoors, such as the paper working sheets mentioned by a girl from the third grade: *“Yes, sometimes it’s better inside when it’s cold and when it’s raining because sometimes the drops can fall on the work sheets and then you can’t see anything anymore”*.

Other observed barriers were that some of the students were more easily distracted outdoors, and several children mentioned that it was sometimes difficult to follow the teachers’ explanations, as one girl from the third grade remarked:

“When they [the teachers] explain something, they often show things and then we often don’t see anything because everyone is jostling and then I can’t really hear either and then I mostly talk to my girlfriends.”

3.2. The Need for Autonomy: To Feel Agentic

“I can totally identify a motivation to learn [in EOtC]/when I observe the children, when I’m outside with them (. . .) how committed they are, how they try to solve their assignments together in a team, how they communicate, how (. . .) high their agency is in comparison to the lessons [inside]” (head mistress).

In the next two sections, I will use the codes “physical activity”, “freedom”, “curiosity”, “relation to everyday life”, “role of the teacher”, “flow”, and “joy” to explain how the richness of the outdoor environment with its many affordances and invitations can satisfy the students’ need for autonomy (see Table 1).

3.2.1. Providing Opportunities for Freedom, Discoveries, and Choices

A common theme in both the interviews with the students and the teachers as well as the field observations was that the students perceived more freedom in the outdoor lessons. For example, this sense of autonomy in the outdoors is expressed in the way the students use the space around them. Freedom was usually associated with not having to sit all day and being more at liberty to move around, as formulated by a boy from the third grade: *“we are freer/we can walk around more; we don’t have to sit all the time like in the classroom (...)”*.

A second aspect of the perceived freedom in EOtC is the possibility for discovery, as a boy from the second grade mentioned: *“There [outside] you can discover a lot. A lot!”* which was then specified by a girl from the same class:

“Because you learn something from nature there [outside], I think that’s nice first (...) because you sometimes see animals, such as a rabbit, hopping across the meadow, for example when you walk along/that happens sometimes and you can also get very close to the birds that are in the bushes. They don’t come fluttering into the school building and then you can also learn about the animals when you’re outside, you can’t do that so well inside”.

As a third aspect, my observations showed that EOtC also enabled the children to make more choices. The students were able to choose both individual strategies on how to work within the assignments as well as how closely they wanted to work together with others, including opportunities for retreats, as mentioned by one teacher:

“When they look for objects to measure (. . .) there is a much greater variety outdoors and then they also have the option to look for a quiet small place to take the measurements by themselves and this makes a big difference” (head mistress).

This quality of the outdoor space with its various affordances has also been purposefully used by the teachers to engage the students:

“They are totally excited about the variety that is out there. They quickly realized that in the village and in our school surroundings they find much more learning opportunities than in a closed room” (head mistress).

3.2.2. Relevance to Everyday Life

Another aspect of autonomy support is that the students understood the practical significance of the learning content and its meaning for their personal lives. Thus, the students appreciated that they were able to learn something from “reality”:

“It’s just nice, because you can sometimes also play games and when we study outside, you also learn something from nature, not just something from books and such” (girl, 2nd grade).

Moreover, the students were also able to bring in their own interests or something from home into the school. The children were always quite eager to share their own experiences and EOtC offered many opportunities to do this. For example, when one girl was allowed to bring her dog along when they learned about pets or when the children could use their own bird watching kits in the forest, this evoked moments of pride which again triggered their intrinsic motivation and curiosity and opened space for autonomous learning.

Another way to increase situational interest was when the teachers allowed the students to react spontaneously to stimuli, for example when the third grade visited the local fire brigade and several students started to follow the water running down the hill after a hosing demonstration to find out where it vanished into the ground, which led to speculations about what will happen with it afterwards. The teacher did not interrupt this process and commented on it in the interview:

“What really impressed me was how the children intuitively ran after this watercourse here on the street, where I thought, yes, that’s exactly it [what EOtC offers]” (teacher, 3rd grade).

At another EOtC session, when the students went to a local supermarket with a whole list of assignments to fulfill, their teacher mentioned afterwards:

“The children learned so incredibly much in one morning that I would not have been able to pack this into ten school lessons in the classroom. This assignment was incredibly rich, it contained plus calculation, estimating, there was weighing, ingredients of food, transport routes, there was packaging material and where does the waste go to, i.e., the whole area of environmental issues like disposal and recycling, then there was organic vs. conventionally produced food, self-made vs. convenient food products, healthy and unhealthy nutrition habits (. . .) that was, really, it was so full! And the children certainly remembered that much more than/well, there are also pages in the schoolbook about it, but I believe that the effect is much greater if you do it right on the spot, in small groups” (head mistress).

Those moments of exerted freedom and the connection to their personal lives often led to joy in learning. The students did not perceive the outdoor lessons to be “real school” as shown in the quote of a girl from third grade: *“Just being in nature. That you have no school”*. Which was also confirmed by another girl from second grade: *“I feel like “m having fun all day and never like I am learning”*.

3.3. The Need for Relatedness: To Feel Connected

“When I take part in things, when I get involved in something, when I get committed, then I am also a part of it” (head mistress).

In the following three sections, I will illustrate how the codes “social aspects”, “physical activity”, “freedom”, “fresh air”, “hands-on activities”, “role of the teacher”, “place and people”, “sharing experiences with the family”, “showing different sides of oneself”, “friends”, and “students’ reflections on teachers” can satisfy the students’ need for relatedness in EOtC (see Table 1).

3.3.1. Peer Connections

When it comes to student–student relationships, the overall impression from the participatory observations and the interviews was that specific qualities of EOtC offered various possibilities for peer interaction. The freedom to move around, the opportunities for free play, and the more informal setting offered some children the opportunity to approach classmates they were not able to bond with in the traditional school setting due to implicit social power structures. Nevertheless, those encounters were not very sustainable; rather, I observed that the social structures from inside were re-enforced outside. In the interviews, every child reported that if it was up to them, they would always prefer to be with the same kids, as one girl from the third grade formulated it: *“I always play with the same ones [in EOtC]”*—which was confirmed by her EOtC teacher when she said in the interview:

“I have the feeling that my evaluation of the social structures in class are more pronounced in EOtC (. . .) I sense that the same [social structures] that I notice in the classroom become more visible in the outdoors, not different” (teacher, 3rd grade).

However, when the teachers deliberately assigned the shared collaborative activities in EOtC in a way that brought together students from different peer groups, there were moments when the new social connections sustained at least over a whole school day:

“I do believe that because of the long time period/that is, during the whole mornings/when they [the students] have to work together in their group/they develop a stronger sense of belonging together in a different way than they would do at school (. . .) that they are able to get to know each other’s strengths and maybe also weaknesses and accept them” (class teacher, 2nd grade).

During these occasions, the children were able to show different sides of themselves which was recognized by their peers and led to higher acceptance. One boy from a family who had recently immigrated to the community, was new to the class and was not able to

participate much in the “normal” classes due to language barriers showed an unexpected talent for painting during the visit to the local art museum which was noticed by a fellow student who exclaimed: “*And Ali/I did not know that he could paint so well! He really painted beautiful pictures*” (girl from 2nd grade). As a consequence, several classmates gathered around, and he obviously enjoyed their recognition.

3.3.2. Student–Teacher Connection

In my study, I observed that the more open EOtC setting created a space that the teachers often used for informal conversations with individual children, for example during walking time to the different EOtC sites and back to school. And the students also seized those opportunities to chat with their teachers and their classmates in a way that was not possible indoors, as in the classroom usually stricter rules of conduct and time pressure prevailed.

Moreover, the students recognized several of the benefits of EOtC they perceived for themselves also for their teacher, as stated by a boy from the second grade: “*she [the class teacher] is getting some fresh air and she’s rested from all the stress of teaching in the classroom*”, and another classmate explicated further: “*I think she’s even happier there [outside] because it’s airier there and if/if, because it’s much nicer outside and it’s not so loud because the others/they look around and if they find something nice then how can you be loud?*”. In addition to getting fresh air and more quietude, being happier and rested, one boy mentioned that his class teacher “*might also see new things [outside]*” (boy, 2nd grade). During the interviews, 21 of the 23 students described their teachers to be happier and more relaxed outdoors, while the remaining two described them to be the same indoors and outdoors—although some mentioned that they were stricter due to safety issues. But the children seemed to understand the necessity of that and did not hold it against them:

“She [the teacher] just has to be a bit more careful [outside], because if someone gets lost, you have to go back and search everything, and she has to be a bit stricter because she has to make sure that we all stay together” (girl, 2nd grade).

Those surprising reflections of the students about their teachers’ well-being and their responsibilities outdoors can be interpreted as a quality of student–teacher connection.

3.3.3. Connection to Place and Community

In addition to what is commonly understood in SDT as relatedness, I have found that relatedness was not limited to people within the school but also extended to the community and places. The teachers used the local community and environment as a starting point for their teaching and most of the various places that they visited with their students during EOtC sessions were in the close surroundings. If it was the monastery down by the lake side, the town hall, the local art museum, different working places or the nearby park area with its forests and meadows—the students experienced “the pedagogical power of place in education” [72] and got to know about the specific place they lived in well.

They learned about the flora and fauna of their alpine upland, about the various local businesses, traditional trade and repair companies, the cultural institutions in their village, and how the municipal council works in “hands-on, real-world learning experiences” [55]. At the same time, they also engaged actively with various people working there and were thus able to build connections—or in the words of the headmistress:

“The main effect is that the children can develop a strong bond with the village, that they can recognize their roots/basically it’s about the roots/and the children are the roots of the village (. . .) and I would like to be part of this village, or I am a part of this village and I would also like to do something in return, because the village also needs something” (head mistress).

My observations show that those “roots” sometimes also expanded to the families at home. For one thing, the students talked more about what they had done during EOtC than about what had happened on an “normal” school day—feedback the teachers received

from many of the parents. And in the afternoons or during the weekends, I observed that the students sometimes brought their family or friends to visit things they had built or special places they had discovered during their EOtC lessons, thus appropriating the outdoor places. This becomes visible for example in the way they gave names to locations of significance for them, like the “Cinderella Meadow”.

The headmistress also interpreted the willingness of many parents to assist whenever additional support was needed as their broad acceptance for this teaching approach:

“I think if EOtC wasn’t also accepted by the parents, then they wouldn’t support it as much. And some of them take vacation time to be able to accompany us (. . .) That is also an element of EOtC, the involvement, the participation (. . .) of parents in school life, the opportunities to help shape it and that is what EOtC offers perfectly. Because it’s not just about baking cakes anymore” (head mistress).

3.4. The Need for Time Spent in Nature

“Because outdoors nature is more close (. . .) and I like nature very much and that’s why I also want to be outdoors. So that you get to know her [nature], so that you get to love her. And not just be inside and not loving her at all” (boy from 2nd grade).

In the next two sections, I will link the codes “physical activity”, “freedom”, “fresh air”, “noise”, “aesthetic experiences”, “curiosity”, “bodily/sensory experiences”, “hands-on activities”, “role of the teacher”, “place and people”, “flow”, “joy”, and “lasting memories” to the satisfaction of the students’ need for time spent in nature (see Table 1).

3.4.1. Aesthetic and Restorative Properties of the Outdoors

The data show that the children clearly see that their time spent in nature during EOtC had a positive effect on their well-being. They specifically stated that “fresh air” and the possibility to hear, smell or see things like flowers or animals (or at least their tracks) as something they really appreciated about being outside: *“because you’re more out in the fresh air, that’s good! (. . .) That you can hear the sounds better. From the birds and such”* (boy, 2nd grade). During several occasions, the students also commended the beautiful scenery or a flowering tree and seemed to take an aesthetic pleasure from being outdoors.

They also associated the enhanced experience of well-being with better learning. A number of students specifically claimed that they could concentrate better when they were outside *“you can think better (. . .) because it’s not so stuffy there [outside]”* (boy from 3rd grade) and *“less noisy”* (boy from 2nd grade). One boy from the second grade who was diagnosed with ADHD added in the interview: *“I also feel much calmer outside”*.

3.4.2. Immersive Properties of the Outdoors

Another topic that was mentioned by several students during the interviews was that they felt that time passed by differently during EOtC sessions: *“[Time] goes by faster at outdoor school and then in after-school care, it goes by slower”* (boy, 2nd grade). Interestingly, this different perception of time was also mentioned by all three teachers during the interviews. They often perceived the EOtC sessions as moments of “slowing down”, when the students got the opportunity to immerse themselves in what they were doing, which happened very rarely during “normal” school days. One example for such a “slow-down-moment” was given by the headmistress when she had asked the students to show her their most special place and was led to a little bay at the lakeside with three beautiful birch trees. There the children were requested to paint that place and got totally absorbed in the activity:

“That was a moment when I thought, yes, exactly, they are connecting something that is very important to them, that is very valuable to them, and connect it with a creative expression. And for me that actually is the highest form of art, to combine the emotional with the creative” (head mistress).

Both perceptions of time moving faster and slowing down are essentially part of the same phenomenon of the qualities and affordances of the outdoors triggering situational

interest for both the students and the teachers. Examples of such moments were finding a fox hole and looking for signs if it was inhabited or discovering signs of the changing seasons while tasting berries and collecting flowers and leaves. Those moments of embodied experiences of learning, relaxation, and immersion show how EOtC can lead to deeper levels of academic understanding and student involvement, as has been commented on by one teacher:

“I have the impression that what the children have learned outside, that they have firmly anchored it in their consciousness, that they remember it, and, in the tests, they also show that they have understood it” (head mistress).

In the interview, the headmistress also explained her motivation for engaging in EOtC with the vivid memories of her own school experiences as a child. The moments she remembered best after almost half a century were all linked to rich encounters with nature.

Yet, the specific learning area is important, which she emphasized when she said that the learning success can sometimes be greater outside—but only if one has chosen the “right place” for the activity, one that offers the affordances that are needed to achieve the determined learning goal. But the richness of the affordances and invitations in the outdoors sometimes also distracted the students from their tasks. My data showed that disturbances always needed to be dealt with immediately to secure successful learning encounters. For example, during two EOtC sessions in winter, the temperature was rather low and some of the students did not wear the right clothing. They started to feel cold, and it soon got to a point where they were not able to concentrate or participate at all.

4. Discussion and Implications

4.1. The Need for Competence

With respect to the students’ need for competence support, the most important finding is that in EOtC, the students had more opportunities to show different sides of themselves and therefore felt more effective and were more engaged in their respective tasks. This might explain why student’s motivation in EOtC has been found to be higher than compared to the indoors in previous studies by Bølling, Otte [24] and Dettweiler, Ünlü [25]. Moreover, Szczytko, Carrier and Stevenson [26] found that students with reported emotional, cognitive, and behavioral disabilities (ECBD) had significantly improved attention spans and decreased disruptive behaviors when learning outdoors. In their study, they seemed to have made similar observations when they quote one of the teachers saying: “They [students with ECBD] were attentive and fully interacted with the activities. They felt they were successful which does not happen much in the regular classroom” (p. 6).

However, to achieve this, the teacher’s role is crucial in creating a safe and supportive frame that enables the students’ self-efficacy, and they need to find ways to encourage individual children or give technical and motivational support. This is in line with general classroom research that showed that the provision of structure and teacher support is vital for the students’ satisfaction of their need for competence [35].

4.2. The Need for Autonomy

An important aspect of the students’ satisfaction of the need for autonomy in EOtC was that they perceived more freedom in the outdoor lessons, which was associated with the way the children were allowed to use the space around them. The higher degree of perceived freedom seemed to enable the students to make use of the places and situations, which has also been described by Mall, Au and Dettweiler [73] and Fiskum and Jacobsen [74]. This corresponds with a study from Germany by Armbrüster, Gräfe [75] who explain this explorative character of EOtC with the children’s active construction of spaces through movement. This qualitative aspect of movement is complemented by quantitative research on the children’s physical activity levels obtained by accelerometry: Schneller, Duncan [76] found that children are more physically active in outdoor teaching settings than indoors and that students satisfy their need for movement during outdoor lessons [15].

The outdoor setting with its many affordances and invitations furthermore provides opportunities for discoveries and choices which leads to increased situational interest. Jung, Zimmerman and Land [77] describe such an increased situational interest when the students are confronted with novel and surprising conditions, as well as with open and varied tasks that trigger their interest. The practical relevance of the learning content in EOtC can prepare the students for challenges in the “real world” [78]. This has also been found in a recent study by Skalstad and Munkebye [79] who showed that children’s interest in natural science activities increases in outdoor environments. The data clearly indicate that this feeling of freedom and agency is associated with a perception of instant enjoyment [33], which seems to be a common theme in EOtC research. In a study among lower secondary students in Germany, “fun” has been found to be the most important category within outdoor learning and was defined as a driving factor of increased motivation [25]. This might also help to explain why choicefulness in EOtC is associated with better stress regulation and cerebral maturation [80] and shows that when students “engage with nature through activities that support the development of their capabilities and self-determination, automatic physiological and psychological benefits of exposure to nature can be expected to happen simultaneously” [41].

4.3. The Need for Relatedness

In contrast to previous studies in EOtC which stated that the outdoor setting has the potential to improve social relations within the peer group [20,81], the observations in this study showed that the social structures from inside continued outside or were even reinforced which has also been reported by Ellinger, Mess [82]. Therefore, the teachers need to carefully consider the composition of the working groups to support new peer contacts and to ensure that everyone can participate and bring in their individual strengths. If this happens repeatedly and over a longer period, this might in fact lead to better peer connections.

Nevertheless, the student–teacher relations improved through EOtC due to more opportunities for informal communication and shared experiences. This has also been found in a study by Mygind, Bølling and Seierø Barfod [23] where teachers perceived better relations with students in EOtC as an added value compared to the indoor teaching.

In addition, the data illustrate that the relatedness in the EOtC context expanded to place and community. Getting familiar with the specifics of a place and its people, visiting several locations during changing seasons, harvesting, and eating something that has been planted together, and especially getting to know many inhabitants and their stories all contribute that the students established roots and sometimes even became active members in their community, for example by joining the local brass band. The findings clearly show that when the teachers became “place-responsive practitioners” [83] and used the interplay between people and place, this constituted a powerful way to satisfy the students’ need for relatedness.

4.4. The Need for Time Spent in Nature

Recently, the biophilia-based theories ART and SRT have been challenged for example by Chawla [41] who argues that the benefits from time spent in nature also depend on an active engagement which is supported by the Goal-Discrepancy-Account of Restorative Nature Experiences [84]. The latter highlights that nature can reduce the discrepancy between an individual’s goals and their current situation, through for example “affording actions that can fulfill thwarted goals” (p. 3).

This is consistent with this study’s findings which illustrate situations where the students had immersive and restorative experiences in EOtC through actively engaging with their natural surroundings. This became evident for example when the children reported that they could concentrate better and felt calmer outdoors. The reduction in stress in EOtC has also been shown in a German study with fifth graders where time spent

in nature was associated with lower cortisol levels at the end of the school days compared to indoor classes [14].

4.5. Strengths and Limitations

This study's significant strengths lie in its longitudinal design and the wealth of various materials collected throughout an entire school year. This allowed for a thorough understanding of the place and people involved, fostering the development of trust and a broader context for individual observations. While case studies are inherently tied to specific cases and locations, this research project possesses numerous aspects that can be applied to similar situations and contexts, both nationally and internationally.

Nevertheless, it is essential to acknowledge a potential bias that may have arisen when I entered the field as an outdoor education practitioner with a firm belief in the valuable benefits of EOtC. To mitigate this bias, I made a conscious effort to approach my role as a researcher and my connection to the research topic with introspection, both before, during, and after data collection. I engaged in frequent discussions with external experts and colleagues to identify and address potential blind spots and conducted repeated member checks. Additionally, spending even more time in the field might have offered insights into the sustainability of the students' initial connections with place and people, which could have been a valuable aspect to explore further.

5. Conclusions

In this article, the hypothesis that the students' basic psychological needs can be met and that time spent in nature in an EOtC context helped the students to feel effective, agentic, and connected, was confirmed. The findings furthermore show that the children's development was driven by their active engagement with environmental affordances and invitations which facilitated embodied and immersive experiences, which was also expressed in the way time was perceived by both, teachers and students. Moreover, the interplay with place and people specifically reinforced their satisfaction of relatedness and created a deepened sense of belonging to their community.

Thus, in order to foster the children's healthy psychological and physiological development in EOtC, teachers should use the affordances and invitations of specific places as a starting point for their teaching to support the students' to "build roots" and develop their agency, competence and sense of belonging.

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Appendix A

Table A1. List over school visits with sites and learning goals.

School-Visit	Class	Month	Primary site	Primary Learning Goal	Secondary Sites	Secondary Learning Moments
1	3	September	Classroom	First-aid workshop, part I (Red Cross junior helper)	School yard	---
2	3	September	Classroom	First-aid workshop, part II (Red Cross junior helper)	School yard, close surroundings of school	----
3	2	October	Market stall at the local food market on the square in front of the train station	Differences between fruit and vegetable; seasonal/native fruit and vegetable; where do the products come from?	Community garden; (about 2 km) walk through the park landscape	Identifying several fruit species; purchasing and paying (calculating)
4	3	October	Wood and park landscape around the school	The Forest, part I (experiential educational games)	Walk to the sites and back (about 1 km)	Games to enhance class cohesion
5	2	October	Classroom (actually an outdoor session about the common earthworm was planned, but it needed to be cancelled because of time pressure due to the upcoming test)	Revision of lessons about fruit/vegetable (preparation for upcoming test); healthy nutrition; calculating within the number range over 100	Public library located in the nearby monastery; walk to the library and back through the park (about 1 km)	How to loan books; how to find stuff in a library; how to behave in a library
6	3	November	Different sites of conifers in the park landscape around the school	The Forest, part II; conifers	Walk to the sites and back (about 1.5 km)	Activity plays; class cohesion
7	2	November	Area in the woods in the surroundings of the school with lots of dead wood	Building and constructing a shelter	Walk to the site and back; a sunny meadow behind the construction area	Activity plays
8	3	December	Local fire brigade	Learning about the fire brigade	Walk to the site and back (about 400 m)	----
9	2	December	The local Art Museum: visit of the Hundertwasser-exhibition	Learning about the artist Hundertwasser; preparing own drawings inspired by the artist	About 3 km hike to and from the museum through park landscape and along a lake	Lifecycles in nature (inspecting a decaying tree trunk at the side of the path); connections to Hundertwasser's recurring motive of the "spiral" to symbolize life-cycles

Table A1. Cont.

School-Visit	Class	Month	Primary site	Primary Learning Goal	Secondary Sites	Secondary Learning Moments
10	3	January	Snow-covered meadow with a slope close to the school	Experiments around fire with the aim to come up with own hypotheses and to test them: how to build a campfire; how do different materials burn (cotton wool, fabric, wool, tinfoil, stone, etc.)	Wider area around the slope; Walk to the site and back (about 400 m); Slope itself	Sledding
11	2	January	Snow-covered meadow with a slope close to the school	Sledding (as part of PE)	Wider area around the slope; Walk to the site and back (about 400 m)	Playing in the snow; building a snow-sofa
12	1-4	January	Rehearsal room of the local brass band in the former 'old' school building	Differences between wood- and brass instruments; how to play a brass instrument	Walk through the village to the old school building and back (about 800 m)	Getting to know about the local brass band; history of the school
13	1-4	January	Gasteig, a big concert house in Munich	Visit of a concert for children	Public transport to and in Munich (about 40 km)	Orienteering on a map; using public transport
14	2	February	Farmstead of the mayor in the village center	Learning about farm and domestic animals (what do they eat, what do they need); learning about the profession of a farmer	Walk through the village to the mayor's farm (about 1.5 km); School yard; Classroom (visit from a student's grandfather with his dog): What does a dog need/eat, etc.	Changes in farming from previous times until today; how to prepare a presentation about one's favorite pet
15	3+1	March	The local Art Museum: visit of the Hundertwasser-exhibition (with two other classes)	Learning about the artist Hundertwasser; preparing own drawings inspired by the artist	About 3 km hike to and from the museum through park landscape and along a lake	Getting to know about the local businesses along the way (e.g., the hotel); older students needed to take care of younger ones
16	2	March	Different meadows in the park landscape around the school	Classifying wildflowers	Walks through the park to the sites and back (about 1 km)	Collecting flowers in order to press them for an herbarium
17	2	March	Meadow, walking path and a dirt mound in the park landscape close to the school	Experiments around 'air' to find out more about its properties	Walk to the site and back (about 500 m)	Activity games

Table A1. Cont.

School-Visit	Class	Month	Primary site	Primary Learning Goal	Secondary Sites	Secondary Learning Moments
18	3	March	Classroom	Experiments around electricity; specifically kinetic energy	Gym (testing out spoons the students had built)	How to conduct scientific experiments
19	3	April	Classroom	Learning about vision/how we see/parts of the human eye	---	How to conduct scientific experiments
20	3	May	Park landscape and woods surrounding the school	Visit of the local forester: what is so special about this specific forest; What does a forester do	Walks through the park landscape (about 2 km)	Discovering a fox burrow and therefore learning about foxes; experiential educational games
21	1-4	May	Local monastery	Learning about the history of the village and the role of the monastery	Walk through the park and village to the site and back (about 1 km)	Different possibilities to preserve history (e.g., through a wall painting)
22	1-4	May	The school's assembly hall	Presenting a poster with the model for the planned ball path by the students of the second grade; explaining what will happen on the project day	School yard	How to do a presentation in front of many people
23	2	May	School yard	Experimenting with building a prototype for the ball path	Meadow and slope behind the school building	How to measure; how to saw
24	1-4	May	School yard; grounds around the school	Whole school project day: construction of the common ball path; working in smaller groups to build single parts for the common ball path	meadow and slope behind the school: this is where at the end of the day, the separate parts will be constructed into one big ball path	Working together in mixed-aged groups; working together with experts; conducting interviews for a local radio feature
25	3	June	Park landscape around the school	Learning about native 'wild' animals through a visiting expert	Walks around the park to different sites (about 2 km)	---
26	2	July	Several businesses and companies all over the village (bakery, boat building yard, monastery, hotel, fishery, pharma company, carpenter's workshop, dentist, physiotherapist, collection station, childcare center)	Learning about the local businesses and companies; getting to know different professions	Walks around the village (about 3 km)	How to do interviews; how to record interviews; how to create a portfolio about different professions (this would be done later in the classroom with the information gathered that day)

Table A1. Cont.

School-Visit	Class	Month	Primary site	Primary Learning Goal	Secondary Sites	Secondary Learning Moments
27	3	July	Visit of the local archive	Learning about the history of the village	Walk through the village to the site and back (about 1.5 km)	How to keep history alive; what to learn from archives
28	3	June	3-day Residential Berchtesgaden	The water-cycle; how water formed the landscape	National Park; National Park Visitor Centre (with workshop)	Who lives in the stream? Determining water quality by examining animals in the water

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