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Exploring Student Teachers' Motivations and Sources of Confidence: The Case of Outdoor Learning

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Abstract

Outdoor learning has become an important part of policy and practice across several European contexts. While research indicates that outdoor experiences can enhance learning and mental health outcomes, studies have also identified a number of barriers to providing such experiences the most prevalent being that of teachers' confidence. Acknowledging the role of Initial Teacher Education (ITE) in preparing teachers for the demands and complexities of providing meaningful, safe and relevant outdoor learning experiences , this article explored teachers' experiences both in general, and within a one-year ITE course in Scotland, employing a qualitative methodology. In particular, semi-structured interviews were used with seven ITE students. Results yielded through thematic analysis revealed mastery experiences as being preferred, while vicarious experiences were also seen as useful. In addition, previous experiences in adulthood and childhood impact on the motivation of student teachers to teach outdoors. Implications for ITE programmes are presented. (149 words)

Keywords: initial teacher education, outdoor learning, motivation, self-efficacy

Background

Scotland has been seen as a pioneer in the provision of high quality formalised outdoor education (Higgins, 2002). Outdoor learning has taken a valued place in the Curriculum for Excellence

(CfE), with an additional guiding policy document being published in 2010 outlining ways that the CfE could be implemented in relation to outdoor experiences (Learning and Teaching Scotland, 2010). The guidance promotes outdoor learning as an essential experience for all children of school-age, and aims to empower teachers to make use of opportunities both within the school, as well as residential opportunities. In the rest of Europe too, outdoor learning has become an integral part of the experiences provided by formal schooling (Becker et al., 2018).

Previous studies in various contexts had identified teachers' confidence[4] in their ability to plan and deliver meaningful outdoor experiences as one of the barriers to all children having access to them (O'Donnell, Morris, and Wilson, 2006; Nundy, Dillon, and Dowd, 2009). Other barriers to effective provision of outdoor learning experiences were reported as cost, and time constraints (Ross et al., 2007). Moreover, in the past, provision had been identified as rather variable, both in terms of frequency and quality (Nicol et al., 2007). A more recent audit of the learning provision in Scottish schools presented a more optimistic picture, especially in relation to primary education, which is the focus of this paper (Christie et al., 2013). Findings of that study show an increase in the use of school grounds for the purpose of outdoor learning at primary level, as well as a largely positive change in teachers' attitudes. While, primary teachers report that weather, cost and staffing ratios are still barriers to teaching outdoors, there is growing enthusiasm for using outdoor spaces, especially those within the school grounds. Findings also suggest that a great number of teachers at primary level would support more professional development

[4] The word 'confidence' is used here, as it is the term that is used in the outdoor learning literature cited. However, in the rest of the article, the more precise term, and construct of, 'self-efficacy' will be used. The difference between the two is outlined by Bandura himself in the following excerpt: "Perceived self-efficacy refers to belief in one's agentive capabilities, that one can produce given levels of attainment. A self -efficacy assessment, therefore, includes both an affirmation of a capability level and the strength of that belief. Confidence is a catchword rather than a construct embedded in a theoretical system." (Bandura, 1997, p. 382) The term 'confidence' is used again in some of the findings, as it was the term the participants themselves used in those instances.

opportunities (75%). The authors pursue this further, as they make a call for future pre-service and in-service training that will build on these changes in attitudes and policy.

In other more recent research, Initial Teacher Education (ITE) programmes have been identified as key to building confidence in teachers in relation to outdoor learning since then (The University of Edinburgh, 2016). Research on the role of ITE programmes and universities in the professional development of teachers has highlighted a multi-layered approach, with a variety of influences upon their development, outside of the traditional university settings (Livingston, 2014). Although Livingston primarily alludes to post ITE experiences and interactions with agencies once a teacher is qualified, we would like to explore how earlier experiences and various experiences within ITE may play a role in the development of teachers' self-efficacy in relation to outdoor teaching. Part of what this study aims to accomplish is to investigate these influences through the experiences of student teachers, and the perceived effect of such experiences on student teachers' self-efficacy.

Literature Review

Research on teacher efficacy has traditionally been based on Bandura's theoretical framework of Self-Efficacy Theory (SET; Bandura, 1977). Two major aspects of self-efficacy are identified in this framework: outcome expectancy and efficacy expectation. Outcome expectancy relates to the belief that a certain set of actions will lead to specific outcomes. More relevant to this study is the aspect of efficacy expectation, which relates to the degree that someone believes they are able, or have the skills to, perform the actions that lead to a certain outcome (Bandura, 1982).

Personal teaching efficacy, a concept developed by Ashton (1985), relates to the belief a teacher has that he/she can possess the teaching skills to attain certain student outcomes. As a construct it has been found to correlate with student achievement (Ross, 1992), and quality of teaching experiences provided (Raudenbush, Bhumirat, and Kamali, 1992). More importantly, for the purpose of this study and the specific theme of outdoor learning, it has been found to have positive associations with willingness to teach certain subjects and enthusiasm for teaching (Allinder, 1994). By helping student teachers build robust efficacy beliefs, ITE programmes could increase the willingness and enthusiasm of teachers to undertake outdoor learning experiences.

The sources of self-efficacy, as were identified by Bandura (1997) focus on experiences, emotional and psychological states and verbal persuasion. Experiences, in particular mastery experiences and vicarious experiences are pertinent to this study. Mastery experiences, or enactive attainments, have a very important role to play in self-perception of efficacy and this has been seen in the development of teacher self-efficacy too (Hoy and Spero, 2005). Successful attempts can have a distinct positive association with self-efficacy levels, while failures can have the opposite effect. SET (Bandura, 1997) suggests that efficacy beliefs may be most malleable during the initial stages of gaining experience, in the case of teaching self-efficacy, during ITE and the induction year. This is further corroborated by research specifically focusing on teacher self-efficacy (Klassen and Chiu, 2011).

Additionally, Self-Determination Theory (SDT; Deci and Ryan, 2011) offers another meaningful explanatory framework on how teachers' feelings of competence and motivation play in pursuing outdoor learning activities. SDT, an organismic theory of human growth, presents the idea that for behaviour to be self determined, and for humans to flourish, three psychological needs have

to be fulfilled: autonomy, competence and relatedness (Connell and Wellborn, 1999; Ryan and La Guardia, 2000). Competence, of relevance here, is construed as a person's need to feel effective in their interaction with their environment and is positively associated with motivation (Deci and Ryan, 2000).

We contend that, while SDT has most commonly been used to look at teachers' use of motivational strategies with their own students (Reeve, 2002) it can also be used to look at the way teachers, or student teachers can be motivated to teach a certain subject. Within SDT research suggests that teachers' perception of autonomy, i.e. whether there were perceived outside pressures from above (e.g. administration, curriculum) or below (e.g. students who were not motivated), was associated with their own self-determination and motivation to teach (Pelletier, Séguin-Lévesque, and Legault, 2000). Additionally, research in the field of physical education showed that teachers' psychological needs satisfaction influenced self-determination and, therefore, motivation (Taylor, Ntoumanis, and Standage, 2008).

Focusing on outdoor learning, early years' practitioners' ' relationship with nature has been identified as increasing motivation to deliver outdoor experiences in a previous study (Ernst and Tornabene, 2012). Elsewhere, nature relatedness (NR) is found to positively correlate with perceived competence and willingness to teach outdoors among Scottish ITE students (Barrable and Lakin, 2019). The same study showed a significant increase in perceived competence before and after an outdoor environmental education session, suggesting the positive effect of the practical personal experience in feeling competent and motivated to teach outdoors. It is with these previous research studies in mind that we aim to see how student teachers' experiences, in a broad sense within and outwith ITE, have an impact on their own confidence and motivation to teach outdoors.

These two different, yet related theories, namely SET and SDT have been integrated in the past, in studying motivation towards physical activity (Sweet, Fortier, Strachan, and Blanchard, 2012). In that particular study, integrating the two theories was not only feasible and desirable, but advanced the understanding behind motivational factors relating to physical activity.

Using these theoretical frameworks, this present study sets out to answer the following research questions:

- How do different experiences affect student teachers' self-efficacy towards undertaking outdoor teaching, based on their own feelings and reflections?
- How do different experiences affect student teachers' motivation to take children outside, and lead learning sessions outdoors?

Method

Participants

Seven students, five of whom identified as women, took part in the research. Sampling was purposeful (Patton, 2002) and following the criteria that participants (a) are enrolled on a one-year post-graduate education course, and that (b) they had participated in all the outdoor learning inputs provided as part of the aforementioned ITE course , which included both indoor lectures, outdoor experiences and a residential trip. The seven participants freely volunteered after being contacted by email. All participants held a first degree in disciplines other than education.

Materials

An interview protocol was designed and approved by the ethics committee for the needs of this study. Questions were designed with the aim to generate data that would enable an understanding of student teachers' appraisals of their experiences, and what motivates and/or hinders

motivation to teach outdoors. The selected method of analysis being thematic analysis allowed for flexibility in the form of the questions developed for the protocol. All of the questions were open-ended and centred around the student teachers' experience with outdoor learning, which included both formal and informal experiences, as well as experiences from their own childhood and the course. Example questions from the protocol are:'Of all the taught sessions and experiences in relation to outdoor learning, which do you feel contributed most to your development as a teacher?' ; "Can you tell me about your outdoor learning experience in your own education (as a child)?" and 'How do you feel the course has prepared you to undertake teaching outdoors?'.

Procedure

After obtaining ethical approval from the University ethics committee participants were recruited through emails and verbal invitations. Seven participants responded favourably, and individual meetings were set up. Individual interview times were arranged, at convenient time for participants. The majority of the interviews (n=4) took place face-to-face and the rest had to be conducted through an online communication platform. Face-to-face interviews were conducted in the researchers' office space. The individual interviews took anywhere from 20 to 45 minutes to complete. All interviews were conducted between April and June 2017 and were audio-recorded, after verbal and written consent had been obtained following the ethics guidelines provided by BERA (2011).

Given the semi-structured nature of the interview, participants were encouraged to elaborate freely on anything they felt was relevant to the questions being asked, while the interviewer listened openly. Participants were also asked to share any experiences they felt were pertinent to

their development of a love for the outdoors and towards their willingness and perceived competence to undertake outdoor learning in their practice, and later in their teaching during their probationary year.

Data Analysis

Tdhematic analysis, was employed with the aim to fairly represent the data, and achieve the right balance between what we looked to find and what the data were telling us (Srivastava & Hopwood, 2009). Accordingly thematic analysis was used as appropriate with both deductive and inductive methodologies (Frith and Gleeson, 2004; Braun and Clarke, 2006). A set of rules, was devised for the development of the codes/themes in this analysis. In particular, emergent categories had to be (a) mutually exclusive and exhaustive, (b) critical: as units capturing data meaning, and as units that when combined would help address the research questions, and (c) consistent: between them in terms of the level analysis they represent (clusters of themes, themes and subthemes). Codes development was guided by theory, particularly key aspects of self-efficacy encountered in SET and the motivational aspects of SDT but also evidence on outdoor childhood experiences. These were reflected in the interview protocol too. Steps involved in the development of the themes from this analysis were (following broadly Miles and Huberman, 1994): (a) data reduction, (b) data display, and (c) identification of themes and links between these themes to address the research questions. Looking to ensure the validity of the themes developed, an outside reviewer was engaged and inter-rater reliability was calculated for two out seven interviews, and found to be excellent as it ranged between 85.7% -91.7%.

Analysis

The following three themes were identified in relation to the ITE experience, through analysis (see details in table 1):

- Mastery experiences: relate to the individual's personal experience in leading or teaching outdoors (including previous teaching outdoors, for example as a teaching assistant or a scout leader). They also include the student teacher's own teaching practice in one of their placements. It does not, however, include the student teacher observations of a mentor teaching lessons outdoors.

- Vicarious experiences: relate to all that a student teacher may experience where one is sharing their expertise, but where they do not directly engage in teaching or leading an activity (including watching a mentor lead a session outdoors, as well as being led through an activity by a lecturer or guide, as in the case of the Botanic garden experience or the residential trip). Watching films or reading about it also fits under this category.

- Nature connection: Nature connection or connectedness as a construct tends to have several aspects, including affective, cognitive and spiritual aspects (Tam, 2013). For example, participants' feelings of being close to nature are captured by choosing to spend leisure time outdoors, including green exercise and other wellbeing practices, as well as statements of emotional affinity (e.g. "I feel that I am close to nature"). A spiritual connection to nature is also included in this. It is important to note that as opposed to the other themes, this particular theme was one that emerged from the data.

- Student teacher's positive childhood experiences in nature: These include both formal and informal experiences during one's childhood. Formal are the experiences which

happen under an organisation, (i.e. school, scout troop, or residential trip provider). Such experiences in school may include lessons and learning walks, but not free play (for example during break time). Informal experiences cover the realm of any home or leisure activities that happen outdoors, not under organised care. This may be any type of free play and exploration, holidays with parents, leisure activities such as cycling, hiking or other outdoor sports. This category may also relate to the location of one's childhood close to nature. Although this fourth theme did not directly relate to the ITE period, the research team felt that it was important to include it in the findings, as well as include ways in which ITE may be able to mitigate in instances where there are no positive childhood experiences.

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- **Table**
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- *Table 1: Coding Key*

Vicarious experiences	**Mastery experiences**	**Nature Connection**	**Positive childhood experiences**	
			Formal	**Informal**
Lectures	Past teaching experience (before course)	Feeling close to nature	School learning experiences	Free play
Outdoor activities on campus (dental school, little garden)	Formal leading role (e.g. scout leadership)	Spending time in nature	Scouts	Location of childhood
Outdoor activities at Botanics	Experience during placement	Spiritual connection with nature	Duke of Edinburgh / John Muir	Holidays with parents
Reading /researching	Outdoor activities during residential		Residential trips	

Watching videos	Other teaching (e.g. previous University courses)

Mastery and vicarious experiences of student teachers (Bandura, 1977; Deci & Ryan, 2011) as well as the ways in which they contributed to increasing feelings of self—efficacy and motivations towards teaching outdoors were outlined and explored.

Mastery experiences

Mastery experiences in placement and during ITE instruction, were very appreciated by all participants, and seen as key to developing their self-efficacy. However a common thread across most interviews (six of seven) was the lack of actual outdoor teaching experience while on placement. While this is, of course, very much dependent on school and placement mentor, student teachers had been unable to either watch or lead outdoor learning sessions, in most of their previous placements:

"[in] my third placement. I know they used the woods, in an adjacent area. Again, it just so happens that I didn't see it take place, but I know they do." (Participant 6)

Elsewhere, the lack of experience in placement was discussed in relation to its effects on self-efficacy beliefs.

"But on placement you have to do what you are told to do. You can't decide what to do. So, I've never seen it be done, so I have not seen how to take and, well, if I don't feel confident that's not going to be a positive experience for them." (Participant 5)

Participant 5 links her lack of self-efficacy to diminished motivation to undertake such an activity, as she feels the final objective, namely providing a positive experience for her students, cannot be reached.

In line with such views mastery experiences were understood as boosting the belief that participants are capable of providing high quality learning experiences for their students, because they provide direct access to practicing the actual skill. In some cases, previous first hand experiences, for example experience with other curricular areas were seen as contributing to gaining confidence and getting better at undertaking such activities. While in some other cases, this was not enough:

"Just doing it! I want to try different things - More experience of actually doing it with real children. The other parts of the curriculum I wasn't too confident about, just doing it really helped." (Participant 2)

Participant 2, felt that "just doing it" was key to gaining confidence. No matter how positive any other previous experience might have been, it was not necessarily seen as relevant to the setting of the school, where there are "different rules" (Participant 4) and regulations, as well as different objectives applied.

And taking this further, there was particular aspect of first-hand mastery experiences that stood out as ultimately the most important, namely first-hand mastery experiences where they get to do the teaching during the first year of being a teacher. Participant 5 states:

"I guess just more hands-on experience of actually doing it with the children. I now have more experience of being taught how to teach outdoor leaning, but just more hands-on experience would be great." (Participant 5)

This is because during the first year they are in charge, the get to be “in charge of [their] own class”(Participant 3).

Finally, there was a recognition for the need to be supported past the ITE course and into their induction year and beyond.

“Maybe my first couple of times that I take my own classroom out I will need a lot of support”(Participant 6).

Vicarious experiences

During the one year postgraduate course the student teachers had a variety of experiences relating to outdoor learning, including lectures, two outdoor sessions in different locations (one on the university grounds, one in a local park), one environmental education in the Botanic gardens and a weekend-long residential trip. They talk of the sum of these experiences as changing the way they view outdoor learning, in several ways.

“I didn’t think about outdoor learning at all. Even like, growing up, I had not thought about it at all. But, since we did the outdoor learning one in the little park, that kind of opened my eyes to how easy it is.” (Participant 5).

Three participants report lived experience and experiential learning as key to developing self-efficacy. The residential trip (a new addition to the course), which consisted of a weekend away, with two ITE tutors at a residential centre, was seen very favourably, as a way to envision how outdoor learning can work. From the various parts of this trip, (like kayaking and abseiling), the

woodland walk, which included a lot of quieter activities and made links with the curriculum was seen as most useful by the majority of the participants:

"This was extremely rich two hours and it brought home just how an outdoor classroom could work. It very much was an outdoor classroom in that we had a few very rich experiences in a very short time." (Participant 1)

Other experiential aspects of the course were also seen as beneficial. A participant mentioned how the two outdoor sessions -within the university grounds and at a local park- affected her learning; she further explains how this practical experience of being outdoors has helped her:

"I think that the outdoor learning inputs that we had, which were actually outdoors, really living the experiences were really helpful." (Participant 6)

In addition, to lived experience three other practices within vicarious experiences were seen as crucial too. The first relates to the direct instruction of the theoretical aspects of outdoor learning, mainly taught through the traditional lecture format indoors, prior to the practical sessions. The timing of these was seen as important, as they were found to prepare the student teacher for the following practical session.

"I liked how we sort of had an indoor session beforehand, so we had some knowledge, we were told to bring something along, it was in groups, so we're the children, you were the teachers." (Participant 5)

The second aspect that was identified was the employment of role play to elucidate some key aspects of outdoor pedagogies, like behaviour management. Employing role play, such as in the instance above, where the students are children and the lecturers/instructors children is

mentioned several times as a useful way to gain experience of outdoor learning. A participant stated:

"I chatted [to the instructor] about that and it was nice seeing and hearing him talk about it, because he was speaking to us, as he would speak to kids. […]That was really useful. If he was explaining what we were to do for the task and one of us interrupted he would just carry on talking and ignore that we had said anything at all. And just small ideas like that." (Participant 1)

Finally, experiences whereby the student teacher is not actually practising the skill, but instead is seeing it done, acts much like an apprentice in the first stages, (for example, videos or through observation) are seen as another valid way to gain in self-efficacy. Videos and online learning have been found to be beneficial in building confidence within ITE in the context of outdoor learning before (Dyment, Downing Hill & Smith, 2018).

"[…] following the elective with xxx (outdoor environmental education session) and the sessions part of the elective for outdoor learning and the residential, [I feel] a lot more confident than I was before." (Participant 1)

One participant stresses *the observation aspect* in discussing the lack of outdoor learning experience on her school placement says:

"So, I've never seen it be done, so I have not seen how to take and, well, if I don't feel confident that's not going to be a positive experience for them. […] I just need to see it be done, and then I will feel confident." (Participant 5)

On a slightly different note, another participant, stresses how the opportunities for vicarious experiences, like in the residential trip, counteract what is seen as an important barrier to making the choice of outdoor teaching: linking outdoor teaching to learning objectives:

"[The residential] - I saw links to the whole curriculum the whole weekend."(Participant 2)

Finally, other vicarious experiences participants mention, include reading and doing their own research. Participant 5, who has also had very few mastery experiences and being motivated to teach outdoor seeks for reliable alternatives mentions:

"Hmmm… I think, honestly, if they don't… I don't know. I was thinking, I went past an outdoor nursery, I was thinking of emailing to go spend like a week with them, just to see what they do. If not, I would research it to the nines, and then when I am in probation speak to my mentor. And see what the rules are. I can watch videos and stuff." (Participant 5)

Connection to nature

Previous research has linked educators' relationship with nature, or nature relatedness, with their motivation to deliver outdoor learning (Barrable & Lakin, 2019; Ernst & Tornabene, 2012); this research allows for further investigation of that link. All but one participant stated that they felt close to nature, and that nature played a big role in their life.

A participant gave precedence to the behavioural and experiential aspect of nature relatedness

"*Most weekends we are outside actually, we are outside, walking the dogs, finding new places to explore, and that sort of thing… and find something new" (Participant 4)*

Another participant mentioned:

"I love the outdoors (with emphasis) […] I love being outdoors, I love climbing mountains, going on walks, getting fresh air"

These and other conceptualisations of the participants' own relationship with nature encapsulate aspects, encountered in the literature as dimensions of nature connection, such as emotional affiliations, cognitive processes, personal attachment, experience and behaviour (Tam, 2013). Spiritual elements, too, were identified by one participant:

"That is the best thing about climbing a mountain, being at one with nature. And I always say that, when you get to the top of a mountain, and you sit down, usually it is quiet. It is always quiet and peaceful. And this feeling of insignificance, it is amazing!"(Participant 5)

Furthermore, engaging with nature in different ways, for example through the art of music, was mentioned by one of the participants:

"I'm particularly close to Schubert's song cycle 'Die Winterreise', which is all about basically walking outside in the winter. It translates as 'A Winter's journey' so I am outdoors in a different way to my siblings." (Participant 1)

This corroborates recent research where art (Bruni Winter, Schultz, Omoto, and Tabanico, 2017) is indicated as one of the pathways towards nurturing our relationship with nature.

Participant 6 saw nature connectedness as an important value to nurture among students:

"[..] it is quite obvious that not everybody has that relationship with the outdoors. And I think it is quite sad, it is a shame. So if we want children to be outside and explore nature, and get

excited about the different species of birds and what have you, out there then we need to provide them [with experiences]." (Participant 6)

The relationship she has built with the natural world is seen as a motivator to ensure that children have similar experiences, and build a relationship too. Lacking such experiences, and being bereft of that relationship seems to her very '*sad*', motivating her to affect change in this state of affairs through her own actions. She is the agent in bringing about this change, by helping children '*get excited about the different species of bird*'.

Student teacher's positive childhood experiences

An important finding of this research project, and one that further extends the current understanding of this topic, was how experiences beyond mastery and vicarious experiences, namely childhood experiences in nature can be seen as an important source of confidence for student teachers. Although these are outside the scope of ITE, in that they happen before and outwith the programmes, a strong case can be made for those who teach within ITE to be aware of the effect these experiences have on student teachers. These childhood experiences and connection to nature that comes from them, as well as the ongoing contact with the natural world, were seen as adding to one's self-efficacy, and promoting the necessary motivation to undertake outdoor teaching. Moreover, the role of ITE as one that can mitigate the lack of positive childhood experiences will be discussed further on.

Five of the participants, when asked about their childhood experiences in nature made a clear distinction between how they had experienced and felt towards outdoor learning, especially in relation to school, versus play or leisure time in nature. There was, thus, a subtle yet important distinction between formal (e.g. school, extra-curricular) experiences and informal (e.g. play,

holidays) experiences in regards to outdoor learning. Two participants recall positive formal childhood experiences, from primary school. One student teacher discusses the dichotomy between play and learning:

"My school had enormous grounds so I can remember playtime […] I remember being outside a lot, but I don't remember it being linked to what we were actually learning. […] I don't link being outdoors to school or education." (Participant 3)

This permeates through and becomes apparent in other participants' responses, where, in their own childhoods at least, outdoors was linked with play, while indoors was for learning. This may, in fact, mark a shift in outdoor learning policy within the Scottish education system; a shift away from outdoor education being linked mainly to residential trips in secondary school, towards a more holistic approach with the introduction of the Curriculum for Excellence (CfE) in 2010-11.

Four of the seven participants remember outdoor learning from their secondary school experience, and mainly linked to residential trips or extra-curricular activities, such as the Duke of Edinburgh award.

"[…] my own outdoor learning experience from school, I can mainly remember going to [outdoor adventure centre] that is really the main experience that I had. I remember going and doing a walk in the woods and all that sort of thing. That was a very memorable experience from high school." (Participant 6)

Participant 1 recalls undertaking the Duke of Edinburgh award in high school. All participants reported other formal, but outside of school experiences. It is interesting to note that five out of seven mentioned that they had been involved in the scouts at some point in their childhood.

" […] I have been involved with the Scouts from 5 or 6 [years old], […]. A few camps as a scout myself, and then as a leader helping out." (Participant 4)

She later goes to link experience with the Scouts with a general affinity for the outdoors, but also, with an increased confidence in leading groups of children outdoors.

Although previous positive formal and informal experiences, especially in childhood, seem to be a motivating factor to teach outdoors, willingness and passion to teach in nature does not go necessarily with confidence to do so (as both Participant 7 and 3 mention below):

"Although I want to go out, to take the kids out, I am not necessarily… I don't really feel confident to do that. But I know it's important." (Participant 7)

"I love the outdoors […] I love being outside. But because, in my mind I have never quite linked it with education, I never thought about doing it. […] I have always been very passionate about outdoors, but was not sure how to do it." (Participant 3)

This discrepancy between feeling motivated, knowing the importance of outdoor learning, yet not feeling confident or encountering barriers to actioning it has been recorded before in outdoor learning research, especially as it links to risk taking activities and wild environment (Ernst & Tornabene, 2012).

But childhood experiences serve as a source for student teachers' motivation to teach outdoors in wanting their students to have similar childhood experiences as they had:

"*Climbing trees, climbing things, like there was a river by my house and we were always by the river, always in the park, always riding our bikes, seeing how fast we can go."*

She later links this idealised version of her childhood to her passion for sharing this with her own students:

"[…] *I think the outdoors is vital! I think, in a world where children don't have the same experiences to me, […] digging holes, climbing trees, I can't remember last time I saw a child in a tree. We spent our childhood in trees, seeing how far we could go. […] You need that time [in nature/outdoors] to separate that time from the stresses of the world. I think it is so important to be out there. To just be! To look at that mountain, the mountain has been there for… years and years. Cavemen looked at it. Just look at the mountain. Just be!"(Participant 6)*

This view is corroborated by participants who have not had outdoor experiences as learners in primary education, and who see it as a barrier. Not having experienced it at that level makes it hard to envision how it would work.

> *"I hadn't, my primary school experience didn't involve any experience of outdoor learning. It's hard to come up with any sort of ideas about how it should look, how it should be and how the kids should be involved in it."(Participant 4).*

Remarks

Looking back at the research questions, relating at how different experiences affect student teachers' self-efficacy and their motivations towards teaching outdoors and by bringing together the two theories (SET and SDT) we can propose two mechanisms of action that emerged through the analysis of the data. Teaching self-efficacy increased through a variety of experiences, both mastery ones, such as simulated practice and role play, as well as vicarious ones, such as lectures or videos.

The first mechanism that we propose precipitated these changes in both self-efficacy and motivation lies within the key construct of *competence.* Within SDT competence is seen as a basic psychological need, alongside *autonomy* and *relatedness* (Ryan & Deci, 2008). Meeting these needs is essential to motivation and development of an individual (Ryan & Deci, 2017). Competence, in this instance, is the need that all beings have to be instrumental in producing desired outcomes within a context, and has been found to positively predict motivation (Wang, Liu, Kee & Chian, 2019). Experiencing mastery, directly through participating in activities, is at the heart of building perceived competence, and is, therefore, a key element of the motivation behind undertaking outdoor learning in a classroom context.

The second mechanism focused on relatedness, the feeling of connection with others and with the environment. In this instance, we bring forward the hypothesis that connection with the natural environment, is one of the motivating factors for engaging in outdoor learning. This connection to nature may be mediated by positive childhood experiences (as has been suggested before by Wells & Lekies, 2006 and others) but in the instances that it is not, we propose that ITE can play that role, through activities that can and do promote nature connection. Participants in this study described some of those activities they undertake, including engaging with art in nature or spiritual elements of nature activities.

It is noteworthy to mention that the third basic psychological need of autonomy, encountered in SDT, was not represented in the themes within participants' interviews. This seems unusual, in that autonomy has generally been found to be an antecedent of teachers' motivation (see indicatively Roth, 2014). However, it can be best explained by the career stage of these student teachers, who are yet to enter their first professional post. Being qualified and in a full-time post,

in turn, could be seen as the determining factor for autonomy being a mechanism through which motivation increases.

Outdoor learning in natural environments, and learning outside the classroom has become an important part of policy across several European contexts (Becker, et al., 2018). This article further explores the role of ITE in preparing teachers for the demands and complexities of providing meaningful, safe and relevant experiences for the children that they will teach. Implications for the design of ITE programmes that focus on providing first-hand mastery experiences to student teachers, as well as perhaps focusing on enhancing their own relationship with nature and therefore their motivation to teach could ensure that the next generation of teachers feels more confident to undertake learning outside the classroom. Another possibility that emerges from the potential use of observations and vicarious experience, including that of video, is the use of online learning materials. This route has traditionally been seen as not fitting for outdoor learning, however, past research (Dyment et al., 2018) as well as the findings from the current project suggest that online learning, especially the use of video, can be an important vicarious experience for ITE students.

Although the specific context of this project was student teachers' perceptions of their experiences in relation to outdoor learning, some of the implications of this work may extend beyond this particular curricular area. The fact that mastery experiences were seen as key to increasing self-efficacy, yet practice placements did not always meet this requirement, could lead ITE providers to consider alternative opportunities, such as role playing or teaching simulations.

Conclusions, limitations and future directions

This qualitative study aimed to explore student teachers' perceptions of how their experiences in ITE affected their confidence and motivation to include outdoor activities in their teaching. This is in line with the literature that suggests that ITE is a fruitful time for increasing pre-service teachers' self-efficacy (Klassen and Chiu, 2011). On the one hand, we found that mastery experiences, where a student teacher is able to practice under support or supervision are particularly highly valued, while vicarious experiences such as researching, reading or watching videos are seen as second-rate alternatives.

On the other hand, when exploring the reasons behind low confidence for student teachers, lack of previous experience, including as a learner, was seen as the main source of low confidence. We found that confidence can be derived from the personal experience of having been in the learner role, both at school, but also as a vicarious experience during the course. Therefore, the role that ITE can play, can often mitigate lack of experience in childhood.

Strengths and Limitations. Most previous research on teacher self-efficacy has largely relied on scales and quantitative measures (Klassen, Tze, Betts and Gordon, 2011).

Conversely, the strengths of this study lie in the affordances of conversations that were had during the interview processes, particularly flexibility and depth, as well as with the understanding and perspectives that the participants brought to the process.

However, it should be noted that the students represented a special sub-set of the whole student teacher population, who had elected to join the outdoor residential offered as part of the one year post-graduate programme of ITE. In this sense, they were all inclined towards recognising the importance of outdoor learning and were keen to implement it in future. This came across clearly in the interviews too.

Although this is not considered a limitation, we feel that readers should be cautioned that this research was influenced by both the researchers' knowledge and preconceptions, as well as the epistemological approach employed. In particular, by using deductive thematic analysis, and grounding the analysis in the theoretical frameworks for SET and SDT the researchers invariable lost some flexibility in the way the data were interpreted and the analysis was more "analyst driven" (Braun & Clark, 2006, p. 88).

Future research. Opportunities for further research in this area would include a mixed-methods study that could explore the effect of such teaching simulations on student teachers' self-efficacy. Finally, future studies could focus on alternative ways of instruction for outdoor learning, including through the use of videos and online course materials.

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Declaration of interest statements

The authors have no conflict of interest to declare.

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