Creativity and outdoor education in primary schools: a review of the literature

Creatividad y educación al aire libre en las escuelas de educación primaria: una revisión de la literatura

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1. This contribution is the result of a collective work. For academic purposes please note that Federica V. Villa has authored *Introduction, Method, Results, Creativity, Creativity in R1, Creativity in R1b, Discussion and Conclusions*; Monica Guerra has authored *Outdoor education, Outdoor education in R1, and Outdoor education in R1a;* Vlad Glăveanu has provided critical and essential revisions for important intellectual contents.

Abstract

The purpose of this paper is to examine the connections between creativity and outdoor education in primary schools by reviewing the studies published over the past ten years in order to build a framework for this emerging field of research. We reported a scoping review of 55 pieces of educational research and professional literature relating to creativity, outdoor education and primary school (R1 group), outdoor education and primary school (R1a), and creativity and primary school (R1b). The search highlighted the importance of the following factors in supporting possible links amongst the reviewed topics: similarities in contextual features, use of materials, need for perseverance, the role of explorative approach, the importance of play and "slow time", the role of adults, and the value of the theory of affordances. In particular, the latter had potential to build a theoretical framework within both of the topics. Potential implications and future directions are also proposed.

Key-words: Outdoor, Creativity, Literature Review, Elementary Education, Affordance

Resumen

El objetivo de este artículo es analizar las conexiones entre la creatividad y la educación al aire libre en las escuelas de educación primaria mediante la revisión de los estudios publicados durante los últimos diez años con el fin de construir un marco para este campo de investigación emergente. Presentamos una revisión de 55 trabajos de investigación educativa y literatura profesional relacionados con la creatividad, la educación al aire libre y la educación primaria (grupo R1), la educación al aire libre y la educación primaria (R1a) y la creatividad y la educación primaria (R1b). La búsqueda destacó la importancia de los siguientes factores para respaldar los posibles vínculos entre los temas revisados: similitudes en las características contextuales, uso de materiales, necesidad de perseverancia, el papel del enfoque exploratorio, la importancia del juego y el "tiempo lento", el papel de los adultos y el valor de la teoría de la percepción. En particular, este último tenía potencial para construir un marco teórico dentro de ambos temas. También se proponen posibles implicaciones y direcciones futuras.

Palabras clave: Aire Libre, Creatividad, Revisión de Literatura, Educación Primaria, Percepción

Introduction

In our century, the so-called traditional education does not meet the demands of the school in various countries around the world. This demands us to seek alternative ways of schooling which offer parallel or divergent paths that respond to the needs of a generation experiencing constant and ever faster change. In this regard, many countries have draft objectives – defined as abilities and skills – education must aim and reach. For instance, the European Parliament has identified eight key competences for lifelong learning (European Union Council, 2018) with a particular emphasis on values such as curiosity, ability to relate, critical thinking and resilience. Elsewhere, twelve competences have been identified, divided into learning skills (the 4Cs), literacy, and lifelong skills, and aiming to include all the necessary capabilities for the student's future career (2009).

If, on the one hand, nations reflect on key concepts and ways to offer new teaching and learning possibilities, on the other hand, those who deal actively and on a daily basis with students are left trying to connect themes, contexts, resources and pedagogical debates.

Creativity and outdoor education are two wide-ranging topics that often feature in teachers' discussions and government agendas as they respond to the needs of the school today (and of daily life). They have also become growing areas of pedagogical research and a timely topic of reflection especially in the context of the current pandemic.

Creativity is nowadays deemed as an essential element for both private and professional life, but it is often ambiguously defined in education: on the one hand, research shows the desirability and effective urgency of an education that cultivates this competence (e.g., Guerra & Villa, 2017b; Guo & Woulfin, 2016; Shaheen, 2010); on the other hand, teachers' perception and management of creativity is influenced by the standardized requests of the school system, thus preventing them from pursuing creativity as an aim (e.g., Guerra & Villa, 2017a; Kupers et al., 2019). Psycho-pedagogical research has long argued that creativity could and should be educated (e.g., Antonietti, Colombo, & Pizzingrilli, 2011; Craft, 2006; Glăveanu & Kaufman, 2019; Runco, 2008), especially when it is conceived as a distinguishing advantage of everyone's present and future or – more systematically – as a process able to put into play a set of skills, knowledge and competences similar to any learning process (Beghetto, 2016; Guerra & Villa, 2019). In these terms, the educational implications become even more meaningful.

Several tools have been validated to investigate creativity – mainly quantitative – focused on the product, the process, or on the conditions that make creativity possible and visible, primarily in contexts of controlled training or in specific tasks (see Kuper's taxonomy in Kupers et al., 2019). In light of the above, a recent study highlighted the need to investigate creativity within a qualitative paradigm, through observational methods (Katz-Buonincontro & Anderson, 2018), in which creativity is conceived as a more than a psychological phenomenon – it involves cognition, but it is also as a social and material act (Glăveanu, 2015; Glăveanu et al., 2019a; 2019b).

Outdoor education has equally become the subject of important pedagogical debates. It is rooted in a long-established pedagogical tradition which today becomes increasingly relevant, with the appropriate adaptations. The growing interest in an educational form that spends part of the time in natural contexts mainly lies in the new generation's need to renew the (lost) connection with natural environments – since most young people live mainly "indoors" – and to recover the innate sense of belonging to the world that characterizes any human being (cfr. biofilia; Kaplan, 1995; Kellert & Wilson, 1993; Waller et al., 2017). The educational and pedagogical choice that integrates outdoor environments into the daily school routine considers the outdoor as a context of authentic and meaningful learning for a fluid, unique and effective experiential type of work (Farné, 2014; Tovey, 2007; Waite, 2011).

Academic research has long revealed the multiple benefits of being outdoors, especially concerning the physical health, attention, psychological, emotional and interpersonal health of participants (e.g., Bowler et al., 2010; Constable, 2012; Rickinson et al., 2004; Sobel, 2008). These experiences enable the student to physically, cognitively and emotionally move in relation with the environment and within a direct and holistic approach to knowledge (e.g., Quay & Seaman, 2013; Tovey, 2007; Waite, 2017).

In addition, the natural environment provides various resources that impact differently the diversity of individuals they include. In this sense, materials from the environment are not resources per se, but they became such when they create unique connections with the person who uses them, cfr. *affordances* (Gibson, 1979). Therefore, in a pedagogical perspective, if the context is perceived and interpreted by the participants in various ways, according to their different personalities, then it may give rise to different and dissimilar resources and opportunities. This means that the more an environment is characterized by flexibility, global complexity and a fluid structure – like natural ones are – the more it will provide for engaging and heterogeneous affordances (Kyttä, 2003, 2004; Waters, 2017). Even more so, one can find exponentially more ways to be in dialogue with it. Educate outdoors – especially in nature – requires the awareness that the environment is an exclusive repository of action potentials or affordances that become manifest in the interaction with individuals who live and act within it. This certainty holds true for children, the focus of the current study.

Therefore, the present review of the literature aims to investigate and describe the studies that have tried to bring together the themes of creativity, outdoor education and primary school, following a previous review focused more specifically on the role of the teacher (Guerra, Villa & Glăveanu, 2020; Villa & Guerra, 2019).

Method

Databases, keywords and inclusion criteria selection

A scoping review of the literature was conducted on four databases, selected for their relevance to the disciplinary sector: Education Resources Information Center (ERIC); Children & Nature Network Research Library; ProQuest Education Collection; and EBSCO Educational Research Complete. This type of review firstly focused on the amount of information available to assess the current span of the literature related to our specific topics of interest (Arksey & O'Malley, 2005).

A first explorative research was guided by three keywords in sequence creativity, child*, outdoor education without any specific filter; it has produced a mass of results that could not be managed (about 5,800 studies). The keywords were thus refined as: *creativ*, outdoor education, elementary school or primary school*, and the following inclusion criteria established: manuscripts should be published in the last 10 years (2010-2020); children/students as subjects – selected with a check in the filters offered by the database; peer-reviewed only; written in English or Italian; keywords "anywhere but not the full text" with the aim to keep the three keywords as central topics of the studies – if the database had this filter – otherwise, "anywhere". The search produced 49 results.

First reading of emerged records

The reading of the titles and the abstracts of the results allowed to operate a very early reading of the studies reducing the records to 19.

The reason for rejected studies refers to research whose focus was outside the selected target (nursery, kindergarten, teachers, secondary education and further), or whose main object was another topic (e.g., technology, mental health, extra curricula activities). A comparison between databases highlights five duplicates, and this reduced again the records to 14.

Development of supplementary in-depth analysis

Due to a reduced number of studies left, two further searches were carried out with the following keywords, based on the same databases and same inclusion criteria: (a) *outdoor education, elementary school or primary school*; and (b) creativity, elementary school or primary school. In (b) we have chosen not to use the keyword *creativ** because it would also have selected studies that used it as an adjective or adverb associated with other central themes; the use of the word creativity instead seems to have gathered studies that consider *creativity* the only or one of the main themes. The first search produced 74 results, the second 93.

An initial reading of the results was operated to exclude irrelevant records, as previously done. The first group of articles decreased from 74 to 20 results; while the second one decreased from 93 to 34. The exclusion criteria include: same records as the parallel or previous review; subjects of the research being outside the selected target (e.g., teachers, secondary school, kindergarten); focus on other issues that make creativity and outdoor education a fringe topic (e.g., technology, health); or being set in particular research contexts (e.g., adventure camp, gifted children, VLE).

Final corpus

The 68 records gathered from the three searches have been analysed and organized in a review table which recorded following key information: year of publication; title/authors/journal or publisher; aim/s; study design; setting; data analysis methods and instruments; participants; definition of… (creativity, outdoor education); main results; hints & links.

With a further in-depth reading of the body of each paper, a further reduction has been made – through the criteria mentioned above – resulting in a total of 55 studies, distributed as follows: n=10 with *creativ*, outdoor education, elementary school or primary school (R1); n=18 with outdoor education, elementary school or primary school (R1a); and n=27 with creativity, elementary school or primary school (R1b).*

Results

The majority of studies were published as journal articles and only two were professional reports of

projects carried out with students at school. The retrieved studies were conducted around the world: n=14 in Europe (Finland, France, Spain, Denmark, Belgium, The Netherlands, Slovenia, Greece, Turkey), n=11 in U.K. (England, Scotland, Wales, Northern Ireland), n=10 in Asia (China, Japan, Korea, Malaysia, Indonesia, Israel), n=6 in U.S.A., n=3 in Australia, n=2 in Canada, n=1 in Africa (Nigeria), n=1 in South America (Colombia), n=1 in New Zealand; n=2 are comparative studies between countries (Australia-U.K.; Uganda-Italy), and n=4 the context is not stated. Most studies were either qualitative (n=28) or quantitative (n=20) in nature; n=4 were mixed methods studies and n=1 was a multi-method one. Some qualitative studies used explorative or ethnographic methods, and narrative approaches; some others were longitudinal or comparative studies, action-research, case-studies, reviews, or professional reports of school projects. Similarly, quantitative studies concerned comparative, longitudinal and explorative studies; the majority of others used empirical approaches, such as semi-experimental, experimental, post-occupancy or scale-development studies; and still others used formative evaluation development approaches.

The following sections described how creativity and outdoor education – the two main topics – were presented within different groups of literature (R1, R1a and R1b) in order to discuss possible connections in relation to the primary school age level.

Creativity

The concept of creativity in educational settings is covered in studies from the R1 and R1b searches, especially in R1b, where that most of the research followed a quantitative paradigm (15 out of 27). Since creativity is traditionally rooted in the psychological field, it is clear enough that the quantitative approach is privileged over the qualitative one, which has only recently become the subject of reflection and problematisation (Glăveanu et al., 2019a; Katz-Buonincontro & Anderson, 2018). There is a clear need to conduct also qualitative studies that would focus more on "a qualitative understanding of the experience, meanings, and processes of creating" (Glăveanu et al., 2019a, p. 4), despite a lower level of generalizability of the results but in view of the diversity of contexts and relationships that only qualitative research methods can capture.

Before tracing the possible connections between the topics, it is interesting to analyse the words referred to creativity in the different studies of the R1 and R1b group in order to grasp the implicit or explicit definitions guiding the analysis within different pieces of research.

Explicit references, theories and definitions of creativity in the 10 studies of the R1 group are found only in three cases, one of which is a review of the literature (Christidou et al. 2013; Engelen et al., 2018; Spring & Harr, 2014). This underlines the possibility that these studies focus more on outdoor educational contexts where creativity is mentioned but remains in the background. On the contrary, in R1b, only three studies do not make explicit specific theoretical references to creativity because they report more general research focused on key competences and sustainability (Barba-Sánchez & Atienza-Sahuquillo, 2016; Boyaci & Atalay, 2016; Ito & Nakayama, 2016). This variable seems to indicate that, when creativity is not the main focus of interest or is not the specific research field, it is not supported by proper clear definitions and theoretical frameworks.

Creativity in R1

More than half of the studies analysed (n=6) include creativity within the characteristics and abilities of game and imagination (Christidou et al., 2013; Engelen et al., 2018; Hyndman & Mahony, 2018; Hyvonen, 2013; Lehrer & Petrakos, 2011; Spring & Harr, 2014) in a connection often supported by the encounter with materials. In fact, in one study creativity emerges from the invitation to use unstructured, recycled materials and loose parts in the school garden which is characterized as creative because "[children] seemed to have an innate drive to use the items in a creative, constructive and playful manner" (Engelen et al., 2018, p. 93). Similar conclusions also come from a research conducted by Hyndman and Mahony during recess in the schoolyard of two primary schools where different types of materials were made available to children. By partially focusing attention on creativity, the study "provides exploratory insights into how the development of primary school students' creativity can be supported or hindered, by the type of equipment provisions made available for students' physical activities within school grounds" (Hyndman & Mahony, 2018, p. 242), opening up new ways of connecting creativity and the outdoor environment. Flexible and unstructured materials seem to be the ideal stimulations for the natural flexibility, curiosity, improvisation, adjustment and problem-solving that elicited by play. Also, in a Finnish school where outdoor education is particularly widespread, creativity was observed as an intrinsic feature of role-playing and authentic play, a component linked to the fun that the play generates (Hyvonen, 2013), and it was understood as a way of learning "linked to cognitive, socio-emotional development, as well as creativity in early childhood" (Lehrer & Petrakos, 2011, p. 74).

The context is also an element which is also associated with games and begins to emerge from the studies, although not always referred to explicitly. A Greek study aimed to explore children's recess experiences (Christidou et al., 2013) highlights, for example, that to encourage creativity and learning school spaces must "allow flexibility in form and usage" (p. 61), which is possible in the school yard. Here, creativity was observed together with children's imaginative ability and free play. This brief reference to external contexts as physically suitable to creativity was also echoed in a systematic review of the literature that explored different possible creative learning contexts (Davies et al., 2013). Authors noted that "there is reasonable evidence across several studies that taking pupils out of the classroom and working in an outdoor environment for part of their time in school can foster their creative development" (p. 84), thus supporting the connections this research aims to explore.

Other pieces in R1 construed the contextual variable, i.e., being in nature, as a source of inspiration for creativity, without making explicit or supporting this view with theoretical references. In these cases, it was interesting to observe how nature acts as an activator of skills that will be used later, such as in writing, art, or science. These are often objectives declared by the teacher, "designed to encourage children to gather inspiration from the outdoors […] and incorporate them into artistic mixed media projects" (Bruni et al. 2017, p. 46). Direct contact with natural environments triggers rich, evocative and ideal imaginative processes for poetic writing which, among other things, "improves students' creativity and cognitive functioning" (Gardner & Kuzich, 2018, p. 439). Creativity in outdoor learning contexts is once again associated with the imagination that now has implications for creative writing (Spring & Harr, 2014) or with a wider, holistic approach to knowledge (Johnson, 2013).

A single study, already mentioned above, extends the consideration on the possibilities offered by the environment by identifying the unlimited affordances of natural environments a way of exploring the complexity – and, implicitly, creativity – of children's productions (Gardner & Kuzich, 2018). By referring to affordances found in nature (Gibson, 1979; Kyttä, 2004; Wilson, 2007), that for the authors significantly impact poetic writing, they implicitly refer also to the socio-cultural theory of creativity (e.g., Glăveanu, 2013; Glăveanu, Tanggaard, & Wegener, 2016) stating that a) each creation is an act deeply embedded in the material and social world that allows and limits the action itself; and b) the creative actor explores the possibilities offered by the surrounding environment (affordances) to discover new ones or to create object with new affordances out of necessity, generating thus creative productions. This is, for us, a potential fil rouge able to relate and connect the three keywords of the R1.

Creativity in R1b

The most up-to-date definitions construe creativity as a complex, multidimensional, dynamic, relational phenomenon, in continuous redefinition because of the numerous variables involved (e.g., Beghetto & Corazza, 2019; Glăveanu et al., 2016). Kupers and colleagues have tried to integrate the main theories about creativity into a complex dynamic systems model in which "the core of creative development consists of the real-time transactions between the child and the child's social (teacher, peers, etc.) and material environment (the task)" (Kupers et al., 2019, p. 114).

Quantitative pieces of research break up the variables that define creativity into observable, analysable and measurable components with the help of different assessment tools (de Vries & Lubart, 2017; Fanchini, Jongbloed, & Dirani, 2019; Tomassoni, Treglia, & Tomao, 2018). They seem aimed at indicating as specifically as possible the elements involved and their connections in order to control and predict them; meanwhile, qualitative ones tend to use descriptive, interpretative and holistic language for the production of idiographic knowledge. Some qualitative studies from the R1b group also base their analysis on authoritative and recent theoretical references, which today are working to generate new directions for research and practice, such as Todd Lubart, Robert Sternberg, Vlad Glăveanu, James Kaufman, to mention a few. Some others instead follow more classic definitions such as those of Torrance (1972), Guilford (1950), Csikszentmihalyi (1999) or Wallach and Kogan (1965), risking to ignore more recent research directions (Alacapinar, 2012; Chu & Lin, 2013; Ertürkler & Bağcı, 2019; Liberman et al., 2012; Welter et al., 2016; Wu & Albanese, 2013).

The majority of studies gathered in R1b (n=9) investigate *domain-specific* creativity that is focused on a specific area or field of knowledge (Plucker, 1998) and deserves attention because "[the domain-specificity] has broad implications for the identification of and educational practices used with creative children" (Han & Marvin, 2002, p. 99). Such perspectives delineate the skills of an individual with respect to a specific area of knowledge, thus also connecting the definition of creativity itself which, however, maintains the standard features of originality and appropriateness (e.g., Runco & Jaeger, 2012). Some studies are focused on scientific creativity, understood "as any thought or behavior in science that is both novel and useful" (de Vries & Lubart, 2017, p. 146), thus im-

plying that the work of the sciences is fundamentally creative (Yang et al., 2019). Others investigate creativity in math, often associated with the individual's competence in solving challenging problems (Novita & Putra, 2016; Siew & Chong, 2014). Other studies – as already observed in R1 – explore the forms of creative writing, such as poetry and narration, considered as such "when they are novel, original, inventive, and unexpected in nature" (Bos et al., 2015, p. 832) and when they are proposing alternative perspectives on the world (Coles, 2017; Niño & Páez, 2018). And still others associate creativity with art, both as a mean to stimulate creativity itself and as a pure and concrete act of making, particular described by sensitivity and free expression (Adams, 2013; Batic, 2014; De Backer et al., 2012; Ito & Nakayama, 2016). A single study combined multiple domains (mathematics, physics, P.E., I.T.C and L1) in a mixed methods paradigm, defining creativity in wider terms as an "exploring and trying things out in a playful – sometimes even foolish – way, without any specific goal" (Ejsing-Duun & Skovbjerg, 2016, p. 88).

According to traditional psychological research on the topic, creativity within a quantitative paradigm is a mental phenomenon which is therefore investigated in connection with variables deemed measurable through specific tests. Some conceive creativity as "an outgrowth of intelligence" and therefore related to it (Hansenne & Legrand, 2012; Welter et al., 2016); some others conceive it as the ability to solve problems (Boyaci & Atalay, 2016; Novita & Putra, 2016), including as entrepreneurial competence (Barba-Sánchez & Atienza-Sahuquillo, 2016). As Kupers and colleagues (2019) underline – as traditional studies did, the physical and relational context plays an important role in the creative process and some of the studies collected here explain those elements thanks to which a context is deemed to be creative. Undoubtedly the relational and social climate is of utmost importance because "the environments in which a person interacts with may suppress, inhibit or stimulate creativity depending on how people in these environments view this person and his/her creativity" (Li et al., 2013, p. 625). This is how the educator's perspective strongly impacts the participants and the context itself (e.g., Jeffrey & Craft, 2004). In this regard, an open, non-judgmental and flexible context seems to be an essential precondition to cultivate creativity (Ertürkler & Bağcı, 2019; Tomassoni et al., 2018; Yang et al., 2019). In fact, creativity is recognized in the way in which the environment enters in relationship and interaction with the individual (Putri, Japar, & Bagaskorowati, 2019), and it thus resonates with the concept of affordances emerging in R1.

Outdoor education

The studies investigating outdoor education are collected in searches R1 and R1a. Among these, different definitions and variations of "outdoor education" were observed in relation to the methods of use of the outdoor space and the type of external area involved. The use of outdoor environments can be direct, indirect or vicarious (Kellert, in Kahn & Kellert, 2002); direct experiences are further divided into immersive (e.g., forest schools) and perpetual (e.g., schools use outdoor contexts as equal to traditional indoor classrooms to spend part of the school time). Consequently, the outdoor areas vary: immersive experiences require high-density natural environments – such as woods, parks, beaches – while the permanent realities exploit the school yard, the garden, neighbouring green areas, etc., which allow a regular use.

Unlike studies on creativity, qualitative research predominates in R1a (n=11), reflecting the fact that the educational and pedagogical field prefers a contextualized, descriptive and in-depth investigation without strong claims of generalizability because of the awareness of the complexity and uniqueness of the variables involved in each educational event.

The words dedicated to outdoor education are similar to each other but have nuances of denomination and meanings coming from the same variety of experiences and ways of educating in nature that make it impossible to enclose in a unique definition (Quibell, Charlton, & Law, 2017). Dolan (2016) offered an interesting reflection showing the variability over time in naming outdoor education, starting from the classic definitions. They range from 'outdoor education' intended as an education "in, about and for the outdoors" (Donaldson and Donaldson, 1958, in Rickinson et al., 2004, p. 17), to the similar outdoor learning', as "education 'in' the outdoors (outdoors activities), 'through' the outdoors (personal and social development) and 'about' the outdoors (environmental education)" (Higgins, in Dolan, 2016, p. 50), an interdisciplinary learning modality, capable of involving and crossing all disciplines of the curriculum. More recently it has been argued by Beams (2006) "that effective outdoor learning needs to move away from fragmented, episodic arrangements towards more ongoing sustained place-based engagements whereby children negotiate what is learned" (Dolan, 2016, p. 50), and coined the concept 'place-based learning', as the foundation of an education that can also take place in the school yard or on school ground.

These four main orientations – outdoor education, outdoor learning, place-based education, school ground/yard education – are represented most in the studies analysed which, in turn, are characterized by direct, immersive and continuous experiences of fieldwork and outdoor visits, outdoor adventure education or school ground / community projects (Rickinson et al., 2004).

Outdoor education in R1

As stated before, all the pieces of literature collected in R1 come from different research areas. The words here dedicated to outdoor education allow us to define it as a context in which studies are located, relating to specific themes such as play, the use of materials, writing, environmental awareness and science.

Outdoor spaces are places particularly suitable for a playful approach that explores and understands them, assuming that play is a privileged learning ground (Gray, 2015; Hyvonen, 2013) and equally connected to cognitive, social and emotional development. This is particularly evident in the use of school yards or school grounds spaces which are characterized by the presence of unstructured materials (Engelen et al., 2018; Hyndman & Mahony, 2018) and by being the children's favourite places (Lehrer & Petrakos, 2011) for the possibility of being explored and transformed (Christidou et al., 2013).

It is precisely the use of materials – that Nicholson (1972) defined as 'loose parts' – emerging in a couple of studies, that can be defined as objects full of possibilities, "critical to the success of play zones and learning centers – this is true for both indoor and outdoor settings […] [they] add both complexity and variety to play units" (Wilson, 2007, p. 28), which increases the quantity and quality of play in children's routines. Observation of children's play in outdoor contexts has indeed recorded that the use of 'loose parts' material has a positive impact on the variety of activities and participants' involvement (Engelen et al., 2018). This finding is consistent with another study where it was highlighted how outdoor play, supported by flexible and movable equipment, is capable to educate cognitively, emotionally, socially, and physically (Hyndman & Mahony, 2018). This holistic involvement of the child is an expression of well-being, motivation and interest in a place that offers opportunities. Outdoor environments provide a particular empirical field for learning in which children, through direct experience with the elements of the context, build knowledge (Christidou et al., 2013) in a flexible, playful and authentic approach.

In fact, most of the studies collected in R1 investigate experiences of outdoor classes intended as places of learning that "involve the synthesis of classroom-based learning strategies and the affordances of the natural environment for cross-curricular learning" (Gardner & Kuzich, 2018, p. 429). Interdisciplinarity is a precious potentiality of outdoor educational contexts, be it school yards or school grounds, or slightly more distant and wild environments, such as parks or woods. Clearly, this cross-curricular knowledge will be more supported by the regularity of opportunities to access outdoor environments, allowing, among other things, to establish that connection with places that refers to the concept of biophilia (Kellert & Wilson, 1993) that many educational programs seek to recover, i.e., environmental awareness and connection with nature (Bruni et al., 2017; Johnson, 2013).

From the literature it seemed to emerge that outdoor contexts in some way influence the persons who act in them. In particular, two studies that reported outdoor schooling experiences with children (Gardner & Kuzich, 2018; Spring & Harr, 2014), guided this interpretation because they have found that these experiences stimulate skills, knowledge and reflections that otherwise would not have been possible. In one case, children have significant resources for poetic writing; in the other, experience has supported the understanding of relationships and biological cycles.

The preference for experience and sensory perception are two of the founding characteristics of any type of outdoor education. In a research on effective learning environments – with a particular attention on creativity, as stated before, Davies and colleagues (2013) identified within the immersive reality of the English Forest Schools a privileged context of learning able to follow the individual rhythms of children, while leaving room for the multiplicity of intelligence of every one and amplifying the connection with the nature in which one is immersed.

Outdoor education in R1a

Studies collected in R1a involved an in-depth and sectorial literature on outdoor education. As noted above, the wide range of proposals and possibilities related to the outdoor prevents the use of a clear and universal definition - which is also common to the concept of creativity – thus allowing it to be interpreted according to different definitions (Dolan, 2016).

The majority of the studies (n=7) use the term 'outdoor learning' referring to the set of proposals and learning methods that take place in outdoor contexts in which the student is in the spotlight and the environment assumes the role of supporter of their learning (Dhanapal & Lim, 2013; Harris & Bilton, 2019; Romar et al., 2019; Stan, 2010). This pedagogical approach is aimed at providing alternative, recursive and long-lasting learning opportunities with proposals that may vary "from those that are tailored towards educational topics and the core curriculum, and broader programmes using the natural envi-

ronment as a context for experiential purposes, engagement and socioemotional wellbeing" (Quibell et al., 2017, p. 574).
The attention placed on 'learning' focuses these studies on different domains – e.g., History, Music, Language, Math, P.E., Science – to demonstrate the interdisciplinarity of the experiences that outdoor contexts offer. It is namely the primacy of the experience which causes these occasions to learn outdoors to have a greater cognitive impact than activities conducted indoor (Kerr, 2016).
The growing interest in the possibilities embedded in learning outdoor is involving at various degrees the curricula of schools in the Anglo-Saxon world, schools which have long considered the use of outdoor environments as a resource for children's learning and, therefore, have regularly integrated them in the school routines (Adams & Beauchamp, 2018; Bilton & Waters, 2017; Quibell et al., 2017).
Indoor and outdoor are two realities not mutually exclusive; indeed, they can (and must) coexist as two complementary contexts (Dhanapal & Lim, 2013) of reciprocal extension: outdoor offers concrete and holistic opportunities for exploration and observation, connecting learning and knowledge; indoor is a place of systematization, the starting and returning base camp.
Similarly, other studies prefer to use the term 'outdoor education' as opposed to 'outdoor learning' – here is why those are often used as synonyms – that is rooted in Dewey and Kolb's learning by doing pedagogy (Harris & Bilton, 2019), to interpret a concrete educational approach that goes beyond the classroom's walls and unfolds "in, for and about outdoors" (Remington & Legge, 2017; Rios & Brewer, 2014). These are the necessary conditions for being immersed in the context (in the outdoor) in order to give it a meaning, a value and to take care of it; at the same time, it is necessary to foster some knowledge about the environment (about the outdoor) in order to understand the characteristics, functions, and risks of taking action (for the outdoor) with sustainable and respectful ways of behaving (e.g., Bertolino et al., 2017; Quay & Seaman, 2013). These pieces of research are mainly interested in the analysis of environmental characteristics or possible actions rather than specific domains, even if they recognize in the outdoor a mean of enriching the curriculum in which learning processes are involved (Ajiboye & Olatundun, 2010).
Similar to the outdoor learning, the outdoor education is also connoted as an educational approach in which the emphasis "is placed on relationships concerning people and natural resources" (p. 153) and the person is involved in an experience that activates and involves multiple senses and languages.
A further group of R1a studies which use the term 'place-based outdoor education' can be distinguished with regard to involvement. It is intended as a program whose main objective is to stimulate an emotional connection between children and the environment they are part of (Lloyd, Gray, & Truong, 2018; Waters, 2017). The local context becomes the privileged educational place for building deep knowledge "so that children will eventually care about landscape, nature and people linked to a place" (Dolan, 2016, p. 56). It is in this perspective that these collected studies analyse and work on the importance of the 'sense of place', i.e., identifying closer places as meaningful because they are rich in values, feelings, emotions and experiences.
The foundation of place-based pedagogy is that "we have to teach children to love the world before asking them to protect it […]. Place-based education is interdisciplinary, student-centred and project based and seeks to connect learners to local environments" (Lloyd, 2016, p. 36).
The collected literature supports these assumptions and highlights that the importance of the sense of place allows to integrate core subjects within an authentic and contextualized approach (Lloyd et al., 2018) oriented towards a holistic perspective, opened to multiple developments (cfr. affordances; Waters & Maynard, 2010b).
The few remaining studies in R1a gather outdoor experiences intended as explicit occasional opportunities to spend time in nature – such as a field trip, two specific projects, and the use of the school yard – reporting the impact on skills and knowledge.
Considering that they are not continuous experiences, they are characterized by a full-immersion occurrence capable of soliciting not only specific learning, but of involving the individual as a whole. The foundation of this assumption is the awareness that an education that includes direct contact with the environment has positive results for both cognitive and emotional learning because "when combinated with personal interest, fieldwork acts as a motivator for learning, promoting the desire to learn for its own sake and therefore enhancing cognitive engagement" (Scott & Boyd, 2014, p. 518).
The study conducted by Chawla and colleagues reports several observations of experiences collected in multiple high-density natural contexts with the aim of understanding how the affordances of a place facilitate or constrain the opportunities for action and experience of the subjects who spend time it (Chawla et al., 2014).
The properties of natural elements for children include "responsive affordances that immediately show the consequences of their actions (such as sand or water), loose parts for construction and creative play, graduated challenges, inexhaustible opportunities for discovery, and recurring patterns combined with even-fresh sensory novelty" (p. 3). Thus, we are observing how an environment rich in elements is full of possibilities and meanings. The full immersion, which also characterizes field trips, has consequences for cognitive and emotional learning through direct contact with the environment itself (Scott & Boyd, 2014).
A particular full immersion reality is the 'outdoor residential centre', as Humberstone and Stan reported (2011) – the only study in this context kept in R1a for its interesting methodological approach – that, with even more emphasis, encourages and supports abilities and competences in a flexible relationship with the environment that has an immersive quality to it.
These studies of dense observations and descriptions are contrasted by a single quantitative research which, by codifying the behavioural outcomes of children in nature-based experiences or nature-based classrooms (Dennis, Wells, & Bishop, 2014), finds five emergent themes: "maximum choice, many child-sized spaces, pathways and borders for play affordances, flexible space, and support for stakeholder engagement" (p. 45), intended to become founding characteristics of an education that occurs outdoors.

Discussion

From the analysis of the results that emerged so far, possible connections can be made between the themes of investigation observed, with the aim of bringing together creativity and outdoor education in relation to the primary school age group.
What seems to shed light on the connection between the themes are the contextual characteristics of the outdoor learning environments, characteristics that activate, support and allow the development of creative processes in those who attend and use them.
The review proposed by Davies and colleagues (2013) begins to deepen the elements in support of creativity which were found within the Forest Schools – but they do not discuss how to transfer them to other outdoor contexts – defined by them as "creative environments" (p. 85). Following the emerging and intertwined findings of the three reviews, these characteristics can thus be expanded and investigated further.
The access to high-density natural contexts is a significant feature of a creative setting for Davies and colleagues (ibid.). Such feature now finds relative antinomies in the literature where it is suggested that a forest or a green area is not always essential to ensure that the context is full of possibilities. In fact, experiences in school yards or school gardens and playgrounds – by way of example – report the opposite (Chawla et al., 2014; Engelen et al., 2018; Hyndman & Mahony, 2018). It is not the physicality of the context that may or may not support the creativity of the individuals, but the relationship they weave with the materiality of specific places itself.
This refers once again to the concept of affordances in terms of perceived and subsequently used possibilities, arising from the relationship between the individual and the environment (Gibson, 1979; Heft, 1988; Kyttä, 2003; Waters, 2017). Creativity resides precisely in that selection of possibilities for action on the world that leads the subject to produce ideas, thoughts, objects (e.g., Glăveanu, 2015) in the form of play (Christidou et al., 2013; Hyvonen, 2013; Lehrer & Petrakos, 2011) or learning (e.g., Coles, 2017; Niño & Páez, 2018; Siew & Chong, 2014; Yang et al., 2019) – although we know that play and learning are not dissociated at all (Gray, 2015; Hyvonen, 2013).
Materials therefore become an 'actor' worthy of being considered and actively explored within outdoor educational contexts because it is through the use of materials that creativity becomes visible. These loose parts (cfr. Nicholson, 1972), such as "simple natural materials, such as pieces of bark, small stones, and seeds, [or] actual construction materials such as pieces of lumber, wire or plastic mesh, and strips of leather or 'fat ropes'"(Wilson, 2007, p. 29), prove to be interesting unstructured tools, open to multiple uses and therefore full of creative potential (Engelen et al., 2018; Waters & Maynard, 2010b). However, materials are also learning mediators (e.g., Guerra, 2017; Quibell et al., 2017) and this interpretation superimposes even more clearly how creativity and learning are strongly connected and coexisting processes.
Another variable linked to the access to outdoor educational contexts is frequency of use. Several collected studies report that regular and recurrent contact in the same outdoor place for a significant period of time is beneficial in several regards, including for creativity (e.g., Ajiboye & Olatundun, 2010; Davies et al., 2013; Dopko, Capaldi, & Zelenski, 2019; Harris & Bilton, 2019; Johnson, 2013; Quibell et al., 2017; Rios & Brewer, 2014; Scott & Boyd, 2014). A recurrent use of outdoors can be understood in terms of access to closer outdoor environments (e.g., schoolyard), as well as joining projects with periodic meetings. These opportunities denote the dual facet of immersive but intermittent contexts, and continuous and daily ones.
Clearly, familiarity with the place not only proves to be a fundamental element for the use and interest in outdoor contexts (e.g., Scott & Boyd, 2014) and for the creation of an emotional bond between the individual and the environment (e.g., Dolan, 2016), but

equally proves to be a significant support for creativity.

Context influences children's physical activity behaviours (Romar et al., 2019) and as such, affects their creativity. In fact, it requires flexible, relaxed, non-judgmental but at the same time motivating and curious contexts, in which subjects feel safe in being able to express their divergent perspectives (e.g., Alacapinar, 2012; Ertürkler & Bağcı, 2019; Li et al., 2013; Siew & Chong, 2014; Tomassoni et al., 2018). These provisions allow an exploratory approach, therefore free and engaged, which takes place through a multiplicity of senses, styles and intelligences. Giving time to explore (Ejsing-Duun & Skovbjerg, 2016) is an essential condition of any outdoor educational context that is characterized precisely as an experiential and multisensory process (Adams & Beauchamp, 2018; Ajiboye & Olatundun, 2010; Dhanapal & Lim, 2013; Gardner & Kuzich, 2018; Quibell et al., 2017). Play, a common dimension in many studies, can be understood in these terms: as a learning process and a way of creative interaction with the environment, the materials, the others (e.g., Hyvonen, 2013).

The time variable is also implicit within the exploration process itself, which requires relaxed and individual times for reasoning, engaging in more attempts, experimentation and reflection. It is a way of proceeding that seems to associate outdoor and creative paths, always requiring adults able to recognize and support these moments as fundamental.

Davies and colleagues underlined the low pupil-adult relationship as the last characteristic of forest schools (2013) and, thus, of the ways to be in the outdoor. On the one hand, it recalls the way adults themselves modify their role when they choose to educate outdoor (Guerra, Villa & Glăveanu, 2020; Villa & Guerra, 2019) and, on the other, how they also play a key role in recognizing and supporting children's creativity (e.g., Fanchini et al., 2019) because, just as the context does, the adult has the capability to support or constrain creative development.

It is interesting to note that a last but not least important variable emerges in several studies, describing a fundamental connection pint for the current investigation (Villa & Guerra, 2002). The theory of affordances is the basis from which to start understanding both outdoor education and creativity. In outdoor studies, it is intended as a theoretical framework used to investigate the relational properties between the subject and the environment based on his/her attitudes, characteristics and interests within a broader socio-cultural space (Chawla et al., 2014). Affordances represent a set of possibilities for materials use at the discretion of the subject who interprets the possibilities offered by the environment as such (Dennis et al., 2014; Waters & Maynard, 2010a). Similarly, in studies of creativity in education, affordances become manifest in the exploration and choice of original and useful use of a material, a space or even an idea (Gardner & Kuzich, 2018; Putri et al., 2019; Wilson, 2007).

Conclusions

The aim of the current review was to describe and summarize studies that connect creativity, outdoor education and primary school over the past 10 years. The literature collected for outdoor and primary school contexts and the one for creativity and primary school is not particularly extensive and it becomes even more limited if the three themes are considered together. The analysis of the words and characteristics of the two central themes – creativity and outdoor education – made it possible to focus on overlaps and to discuss these constructs in relation to each other.

The theory of affordances emerges as a key theoretical framework and ideal point of connection for both themes (Villa & Guerra, 2020). In fact, materials and environments are not resources per se but become so when they create unique relationships with the subjects who question them (Gibson, 1979). The reviewed literature points to the multiple and interdisciplinary characteristics of outdoor educational contexts. The natural density, the presence of unstructured materials, the different attendance modes of the environments (which implies the familiarity with them), the prevalence of an exploratory approach (which is possible in relaxed times and with a non-directive adult) are all variables that shape multiple and dissimilar resources and opportunities. The complexity that characterizes these environments and their flexibility and fluidity of use – never equal or structured – allows for the emergence of different interactions which, although falling within the infinite potential possibilities for action of the subject (Kyttä, 2003, 2004), can become clear creative expression as new ways of dialogue, in terms of insight, creative problem solving or simply of going beyond conventional standards (Glăveanu, 2012).

All this allows us to hypothesize a positive relationship between the contexts of outdoor education and children's creativity. Starting from these grounds, and from the multi-faceted characteristics of the natural contexts that foster creativity in school age children, it is possible to start a research aimed at investigating how the affordances present in outdoor educational contexts can be understood as creative possibilities by the participants who use and question them, especially in primary schools open to educating students beyond the walls of the classroom.

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