Future teachers' relationships with physical and technological environments

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Abstract:

Is future teachers' contact with the physical environment significant enough for them to choose to educate their students about sustainability? These digital natives stand out from previous generations by their way of living, working and learning. Does the use of ICT by these young adults contribute to distancing them from the physical environment? Are future teachers, better informed thanks to technology, committed to environmental action? This research based on grounded theory was aimed at understanding future teachers' relationships with physical and technological environments. The analysis of individual and group interviews with Moncton and Montreal teacher education students reveals that future teachers maintain a sporadic relation to the natural environment. They are still conscious that nature provides them with calmness, rejuvenation, and beauty. The Internet, visited at least two hours daily, offers them distraction, social affiliation, and personalized information, as well as facilitates their tasks and contact with the World. Future teachers are critical and cautious in their use of ICT, but are not much involved in the environmental cause. This research emphasizes the need to work on future teachers' relationship to the physical environment with outdoor activities to get to know, appreciate, analyze, and improve the natural and urban environments.

Key words: education, environment, Social networks, pedagogy.

1. Introduction

Raising students' awareness about the environment is a pedagogical choice that remains optional in many Canadian primary schools. This kind of education is nevertheless essential for future generations to learn how to solve environmental problems and to adopt sustainable lifestyles and practices. Unfortunately, many primary school teachers see environmental education as a curriculum component of little importance (Marx & Harris, 2006). How do we explain teachers' disinterest? We may wonder if, nowadays, future teachers have a contact with the physical world that is significant enough for them to choose to give their students an environmental education. Indeed, teachers in training (future teachers), similar to *digital natives* because of their age (Oblinger & Oblinger, 2005), spent less time than previous generations playing outside during their childhood (Burdette & Whitaker, 2005), make extensive use of ICT and differ from previous generations by how they live, think, work, and learn (Lardellier & Bryon-Portet, 2010). Does intensive use of ICT by young adults distance them from the physical environment? In environmental education, it is believed that meaningful

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experiences in a natural or human-built setting foster interest in the environment and, eventually, commitment (Chawla, 2006). When people identify with their environment, they speak about it in positive terms and tend to get involved in environmental actions. Thus, if teachers take an interest in the physical environment, they will transmit their enthusiasm to students, while leading by example. However, we know very little about future teachers' connection to the physical environment.

Furthermore, what about future teachers' relationship with the digital environment? Accused by some but celebrated by others, technologies represent today a daily activity among youth, as well as a tool to help them accomplish several tasks simultaneously and quickly (Barnes, Marateo, & Ferris, 2007). But we are still unaware of future teachers' experience in digital environments. What do they do there? Why do they go there? Do the resources offered by digital environments (information and social networks) contribute to better informing these young adults about the environment and support their collective action? The aim of this research was to document future teachers' relationship with physical and digital environments, as well as identifying what these environments mean to future teachers. *To what environments do they go? What do they do on Internet, in nature, and in human-built settings? With what environments do they identify? What stimuli do they look for in these environments? What needs are these environments meeting?* This research sought to answer needs relative to developing knowledge in sustainability education and in ICT-enhanced learning.

This article reports our interviews with students enrolled in the Bachelor of Education in Primary School Teaching (at the Université de Moncton and at the Université du Québec à Montréal) concerning their experience with digital and physical environments (natural and urban settings).

2. Relationship with Physical Environments

The concepts of place attachment (Proshansky, Fabian, & Kaminoff, 1983), ecological identity (Thomashow, 1995), environmental sensitivity (Pruneau, 1995), and community identity (Hummon, 1992) describe various aspects of a privileged relationship with natural and human-built environments. Chow and Healey (2008) define place attachment as a complex and multidimensional phenomenon that includes different aspects of one's relationship with a place and the emotions, knowledge, behaviours, and actions related to place. This form of attachment is one of many factors that encourage people's involvement in environmental action (Chawla, 2006). Meaningful experiences in natural or human-built settings and positive influences from close relations generates a close relationship with the biophysical or community environment (Arnold, Cohen, & Wardner, 2009). People become attached, among others, to environments for their affordances, that is, what these environments can offer them (Gibson, 1977). The more opportunities a place offers in terms of comfort, intimacy, safety, serenity, (Altman & Low, 1992), or friendly ties (Pretty, Chipuer, & Brampston, 2003), the greater the attachment becomes (Rollero & De Piccoli, 2010). With respect to affordances in a natural setting, Pruneau, Gravel, and Ouattara (2002) found that teenagers consider nature to be a place to relax, think, be filled with wonder,

play, dream, and learn. Finally, Cuba and Hummon (1993) note that people's involvement in actions to improve a place reinforces their relationship with this place.

And yet, in the past decades, anthropologists have observed a gradual decrease in the quality of human relationships with the biophysical environment and the community. Malmberg (1992) describes this change in terms of identity loss, weak awareness of space and time, forgetting the pace of life, and decreased territoriality. He explains this loss of community and ecological identity by the loss of natural wilderness and the hectic pace of urban life. The issue is the loss of experience, that is, a less direct and less frequent contact with phenomena and people in the place of belonging. Most people would be less regularly exposed to colour, shapes, sounds, and the magic of rich and vibrant landscapes. This social phenomenon may be at the root of the apathy and lack of responsibility expressed regarding the environment. However, we know very little about the quality of the relationship young adults, and more particularly future teachers, have with their physical environment.

3. Relationships with Digital Environments

Research on the digital activities of young adults is also embryonic. Internet is now considered an environment where people live, learn, evolve, and socialize (Tapscott, 1999). The social world of future teachers includes physical and virtual environments, their real life and their online life mutually complementing one another (Larsen & Ryberg, 2011). Internet moulds young adult's personal identity because they use ICT on a daily basis for communication, entertainment, or information (Martinovic & Freiman, 2011). Technology, accused by some but celebrated and made less alarming by others, has become a need. Young adults share their preferences, creations, games, opinions, and feelings with their social network (Larsen & Ryberg, 2011). Social networks, which require a considerable daily investment in time, is a source of human contact and support for young people that is always available (Horst et al., 2010). *Connected*, young people influence one another mutually by sharing their experiences and ideas or by posting them for all to see on Internet (Margitay-Becht & Herrera, 2012). Their search for social interactions motivates them to communicate with a diverse audience and exposes them to a range of ideas and cultural differences, all the while giving them a social inclusion perspective (Dorman, 2000). Young people are part of interest groups related to their activities in real life: sports, artistic production, or cultural community (Margitay-Becht & Herrera, 2012). Such a good access to information reinforces their autonomy and their critical skills. Concerned about freedom of expression, young people have strong opinions (Tapscott, 1999) and are more decisive (Oblinger & Oblinger, 2005). They have also developed a capacity for multitasking (Boubée, 2011) since this ability is necessary to accomplish everything that must be done in the limited time available (Barnes, Marateo, & Ferris, 2007). Showing little tolerance for texts and conferences, they prefer short visual explanations, interactive multimedia, 3D environments, and animation (Oblinger, 2008). Greedy for stimulation, young people prefer active learning, thus revealing themselves kinaesthetic and experimental learners (Pletka, 2007). The digital experience of young adults, still poorly known, contains nevertheless some negative aspects:

cyberaddiction, cyberbullying, information overload and over stimulation, manipulation of values through the transmission and repetition of biased information, and decreased capacity to communicate face to face (Feiertag & Berge, 2008).

4. Methodology

In order to explore gradually and in depth the relationship future teachers have with digital and physical environments, we chose to use grounded theory (Glaser, 2007) as our methodological approach. Participant observation and individual interviews followed by group interviews were used in order to progressively build a model of future teachers' relationship with various places. In order to avoid that they take sides, for or against ICT, we began this study by exposing the three researchers' personal biases. The objective of participant observation was to immerse ourselves in the digital environments visited by young adults (Facebook, blogs, etc.). The principal investigator surfed on Facebook during one year to understand the pleasures and the issues involved. In 2013, we started by carrying out two individual interviews to begin understanding the students' experience of these two environments. The volunteers were 12 students (11 female and 1 male) from the Bachelor of Education in Primary School Teaching at the Université de Moncton and 14 students (10 female and 4 male) from the same program at the Université du Québec à Montréal. The sample was representative of the student's cohort and came from both urban and rural settings (mostly rural). One of the interviews dealt with the digital places visited and the other with the physical places. Here are examples of clarification questions (Vermersh, 2003) from the interview guide for digital places: *If you'll allow me, I'm going to bring you back to yesterday. Where did you go online? Choose an activity that you did. What did you do? What were you thinking about? How were you feeling? Do you go there often? Why? What makes you happy about this place? Where will you bring your students with ICT? Are you involved in a collective action?* Now, here are examples of questions from the interview guide for physical places: *Yesterday, you say that you went… Try to remember what was going on around you. What were you doing there? Were you doing something else? Try to recall what you were thinking about. Would you like to tell me about it? Do you find this place pleasant? Please explain. Do you go there often? Why?* We then applied a thematic analysis (Paillé & Mucchielli, 2008) to the verbatim transcripts of the individual interviews from Moncton and Montreal to obtain a first understanding of future teachers' relationship with the two types of environments, which involved three researchers reading the corpus independently, identifying and describing the themes, and the researchers meeting to consult one another. Our main inspiration for the analysis came from the affordance theory (perceived benefits provided by the places; Gibson, 1977). Tables were prepared to show the places visited by the students; their activities in these places; and their feelings and the affordances perceived for these places. In order to outline the importance of various emerging themes, numbers represent how many students were associated to each theme.

In 2014, we interviewed two groups to give meaning to the observations so far accumulated; one tackled digital places and the other physical places. These interviews were carried out with 10 student volunteers from the compulsory course in Science didactics at the Université de Moncton. Accompanied by Power Point presentations to

show our initial results, the participants were asked to talk about the validity of the results produced by the researchers from the individual interviews and to provide comments and additional information. The students' contributions during the group interviews were added to the result tables to explain and illustrate these results. Topic trees were finally prepared to synthesize our findings.

5. Results: Future Teachers' Relationship with Digital Environments

Digital places were repeatedly visited on a daily basis for long periods of time. The places most visited[1] by future teachers were, in decreasing order of importance: Facebook, Internet through Google, YouTube, Pinterest, and Skype (or Facetime).

Facebook, very popular and very often visited during the day, was used to get news (from friends and events), look at pictures and videos (of friends and oneself), participate in interest groups (work, leisure), organize social meetings, communicate with people (close and far), comment on other people's postings, and play games in groups. Facebook was given the following affordances: sharing accomplishments, nice moments, and pretty pictures; planning activities with friends; increasing contact with various people; receiving attention and encouragement (by calculating the number of *Likes*); mutual aid for school work and life in general; support for making decisions; remembering good memories; leisure and relieving boredom; and a tool for getting information on strangers. Facebook fascinates with its availability, its speed (no need to move), its variety, and its ease of access. Facebook procured feelings: pleasure, frustration, anger, curiosity, etc. Participants visited Facebook by force of habit and/or by obligation. On it one consumes information and rarely creates (ideas, images, or modes of use). And yet we found that they remained cautious and critical of the time spent on it, what one posted, and one's choice of friends. Future teachers nevertheless experienced difficulties stating the exact amount of time spent on Facebook every day.

Internet through Google was used to do research, to find personalized information, to orient oneself in space, to organize trips and outings, to look for new ideas, to access information immediately unavailable, to meet people, to look for music and movies, to surf, to shop, and to make financial transactions. Participants named the following affordances: facilitating work and projects (rapid access and diversity of information), obtaining help for writing (spelling), a source of pleasure, escaping everyday life, and overcoming solitude.

YouTube was used for watching informational or popular videos and listening to music. It was perceived as a place for entertainment, information, learning how to do things, listening to songs, commenting on movies, or broadcasting information about oneself as an artist. Pinterest was used for finding suggestions of pedagogical activities or ideas related to ones interests (e.g. recipes and clothing). Pinterest represented inspiration or excitement because of the new things found there. Skype or Facetime were used for meeting people face to face, mainly friends or remote family members. They were used to gain access to the non-verbal aspect of conversations.

Figures 1 through 4 show our understanding of the relationship future teachers have with their digital environments. In these figures we note that ICT seem to meet certain needs presented by contemporary life: quickly accomplishing many tasks at once,

pleasure, inclusion, and access to a globalized world. In figure 1, for example, we note that ICT represent answers to operational and performance needs in a fast-paced society where there is an excess load of tasks to fulfill. To rapidly carry out daily tasks, one consulted network of friends, looked for information or ideas, did financial transactions, and used geographical maps online.
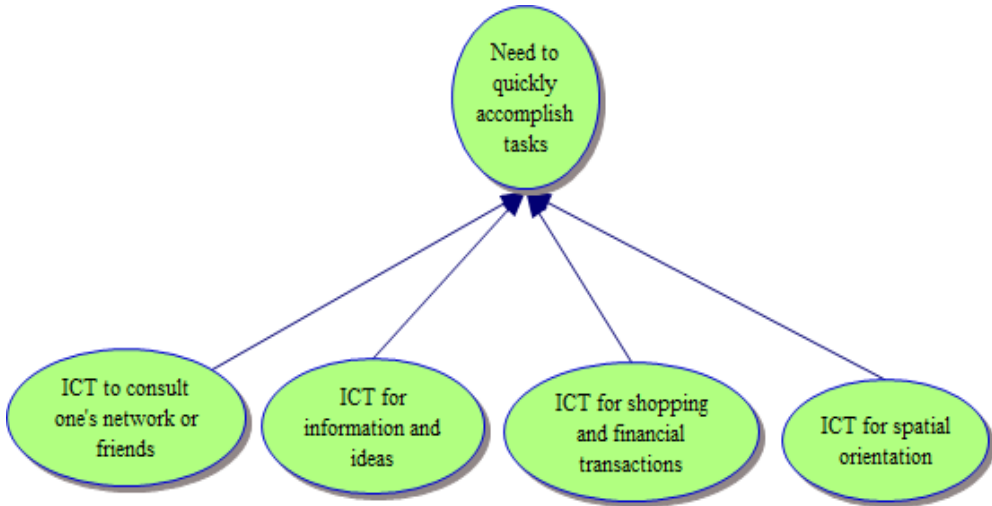

Figure 1: **ICT to Meet the Needs of a Fast-paced Life**

In addition, in Figure 2, we note that ICT offer sources of pleasure and adventure. Our participants found it pleasant to meet new people through ICT, to look at numerous things presented in a way to stimulate curiosity, to find things corresponding to personal interests, to use them instead of more costly traditional media like television or cinema, or to play games.
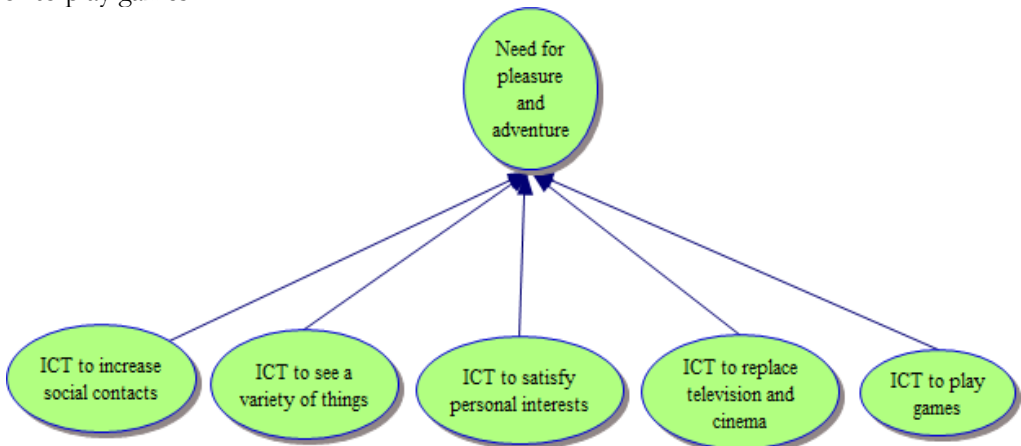

Figure 2: **ICT to Meet the Need for Pleasure and Adventure**

Figure 3 shows the need for social inclusion expressed by our participants. In this case, ICT were used to feel a sense of belonging to social groups, to express positive aspects of oneself, to overcome solitude, or to make new friends.
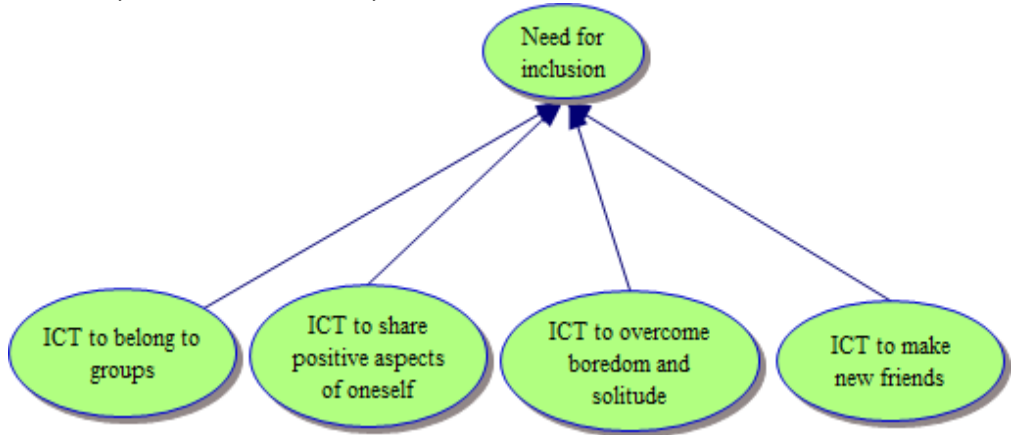

Figure 3: **ICT to Meet the Need for Inclusion**

Figure 4 shows future teachers' need to participate in a globalized world that has no geographical limitations. Our participants dream of travelling and coming into contact with new cultures. ICT meet these needs by ensuring access to landscapes, opinions, and other cultures.
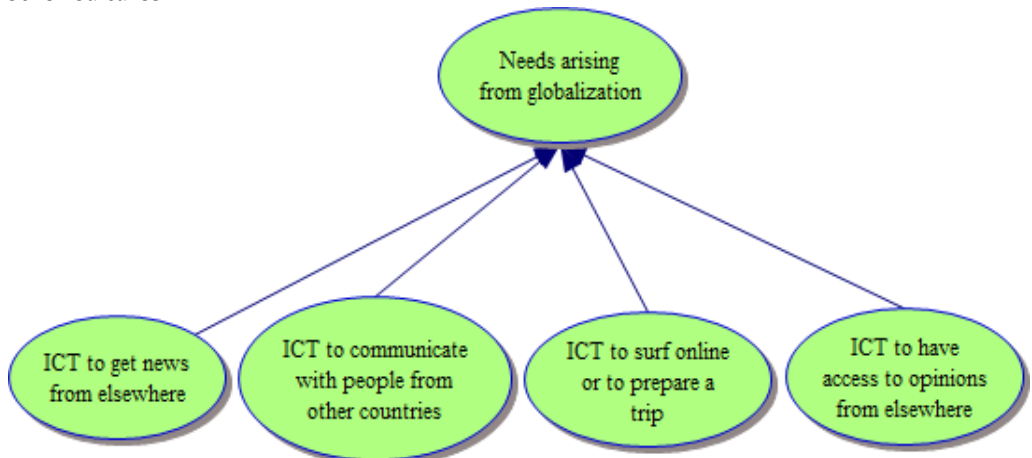

Figure 4: **ICT to Meet the Needs Arising from Globalization**

According to our participants, ICT were rarely used to create (products, ideas, etc.) or to take part in environmental actions. In fact, the environmental cause was considered more as a problem rather than an opportunity. Except for a few more "green" participants, the environment was linked to work instead of to a commitment to improve the world. The future teachers mentioned that excessive use of ICT can generate feelings of fatigue and saturation. Finally, they claimed to still acknowledge the importance of face-to-face human relationships.

5. Results: Future Teachers' Relationship with Physical Environments

Physical environments, excluding the places for work and studying, were visited more sporadically than digital environments. These visits were limited by time constraints, season of the year, and access to cheap means of transportation. The physical places most often visited by future teachers were, in decreasing order of importance: nature and natural parks in urban areas, shopping centres, friends' homes, sport centres, restaurants/ cafés/bars, movie theatres and local landscapes. Future teachers, particularly athletic ones, did physical activities (bicycling, climbing, etc.) or outdoors activities (gardening, camping, picnics, picking, etc.) in nature and in natural parks in urban areas. They claimed to walk alone, with close relations, or with a dog, often on trails they had personalized. In addition, they listened to music or took pictures. Participants said they visited natural places to stay fit or healthy; to feel good with their close relations; to contemplate nature; for the silence, peace, relaxation (*to stop worrying*); to think about oneself; to plan their future; to take a break from the world's fast pace and ICT; or to remember their childhood (nostalgia). In Figure 5, we note that nature meets the need to protect oneself from society's fast pace, as well as the need for peace, contemplation, and reconnecting with oneself. Future teachers claimed to still be connected to nature and conscious of the benefits of this type of environment, even though they did not visit such places regularly and their visits were more frequent during nice weather.
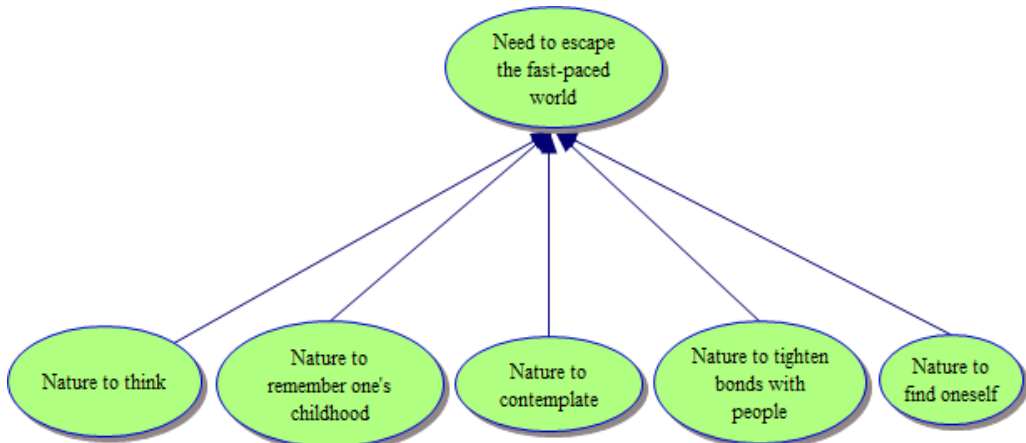

Figure 5: **Natural Environment Meets the Need to Escape the Fast-paced World**

Future teachers said they walked (alone or with friends) and shopped in shopping centres. They go there to relieve their boredom, to get away from it all, and to see what is new, or to meet new people. At their friends' homes, participants danced, played games (board or video games), talked, worked, watched television programs, or prepared food together. The affordances mentioned for visiting friends are the following: get news and spend quality time together. Sport centres were used to stay fit, to stop worrying, to reap the benefits of physical activity (mood, self-esteem, and energy), to meet people (increase

one's social network), to push their physical limits, to counteract worries, or to be alone. In cafés/bars/restaurants, future teachers said they worked alone or in a group, met friends, ate, and listened to music. Participants associated cafés/bars/restaurants to the act of bonding with friends, to eating specific or new foods, and to a work-friendly atmosphere. Another interesting type of place mentioned and visited only by the participants from Moncton was driving to various locations nearby. In their native village, some Moncton participants developed this habit of taking car rides. Either alone or with friends, they drove near their place of residence to discover new places, to look at landscapes similar to where they came from, to relax, to think, to stop worrying, or to feel close to their friends or lovers.

6. Discussion

Among the future teachers in our study, who were between the ages of 20 and 25, the decision to visit one or another digital or physical place was influenced by their previous habits and experiences (e.g. car rides in Moncton), the pleasure linked to places, the season, the large number of tasks to accomplish (and quickly), their friends' choice of locations, transportation, and finances. Digital environments were mainly connected to stimulation (pleasure, surprise, and curiosity) or to rapid multitasking. The natural environment was associated with peace, "recharging one's batteries", and contemplation. Thus, the perceived affordances for digital and natural environments were completely opposed. Other physical places like shopping or sports centres, landscapes seen while driving, and friends' homes had two purposes: social inclusion and pleasure.
When questioned about the environments they would visit with their students, the future teachers mentioned *nature*, *museums*, or *theatre* and, online, *word processing programs*, *search sites*, and *YouTube*.

Conclusion

Data analysis required thoroughness and caution in order to avoid value judgements regarding future teachers' chosen environments. We found that our participants visited digital places very often and physical places only sometimes. They appeared aware enough of the advantages and limitations of both types of places. For most of the participants, a critical mind nevertheless accompanied their frequent use of digital environments. Several tried voluntarily to limit the time spent online and to control their Facebook experience. Participants' use of the natural environment seemed to be decreasing, even though they knew the benefits of such places on their health. Would the time spent meeting the necessities of a fast-paced life and the long time spent in digital places explain the decreased visits to natural places, despite the importance given to the latter? Would a fast-paced life and lack of time explain participants' limited involvement in community environmental action? It seemed that the importance future teachers gave to the natural environment was lessening and existed as an afterthought. Having visited this environment during their childhood, participants still believed in its positive effects, but efforts were necessary to transform their interest in this environment

into actual visits to physical sites. However, the more athletic students still seemed inclined to visit the natural environment with enthusiasm.

With respect to attachment, our participants claimed to be attached to friends, including those on Facebook. Facebook seemed to offer opportunities for comfort, intimacy, serenity, human connection, and pleasure, which may have stimulated a sense of community identity or a sense of belonging to a group of friends. Participants claimed to be more attached to the natural environment of their childhood, but less attached to the natural and human-built environments of the city they resided in at the time of the study. In this way, they expressed an ecological identity (Thomashow, 1995) linked to childhood places and a weaker ecological identity linked to their current place of residence.

In conclusion, since these results lead us to worry about participants' future attachment to the natural environment and about their involvement in environmental actions, we believe that it is crucial to visit natural places with our future teachers during their university studies. We need to remind them of the benefits of such visits. We also need them to participate in community environmental actions to show the effects this kind of action can have on the construction of social relationships and on one's self-esteem. Future teachers' involvement in local community actions could contribute to shaping their community identity in connection to their new place of residence. Regarding the digital environment, we should use various technologies for the purpose of creating ideas or products. Critical discussions in class would also help students think about their choice of places and manage their time according to their health objectives.

Additional studies should be carried out to understand the relationship the next generations will have with the digital and physical environments. Indeed, future teachers in our study claimed to be worried about younger students, who did not have the opportunity to play in nature, even though they may have lived in the countryside.

Note
[1] At the time of the interviews, Instagram was not yet popular among young people.

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