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Key Aspects of Adolescents' Environmental Attitudes with a View to Transformative Education

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Abstract: The aim of this study is to gauge the environmental attitudes of adolescents in order to improve environmental education plans. To this end, the Attitudes Towards the Environment validated survey was applied to 346 adolescents (51% boys and 49% girls, mean age = 15.05) at secondary schools in Cordoba (Spain). A factor analysis (FA) was carried out using the FACTOR program, obtaining three factors: emotional, cognitive, and behavioral. The results of the FA exhibit excellent internal consistency, with an Omega coefficient of 0.916 and Cronbach's Alpha of 0.915, and adequate goodness of fit. The emotional factor results are good, as concern and responsibility towards the environment were notable. However, this did not translate into motivation to obtain further knowledge or to become involved in collective civic actions. The findings in this line give us information to review educational objectives and methodologies, for which emotional education is essential. Elements are proposed to encourage adolescents to adopt more proenvironmental attitudes so that the development of environmental awareness and concern in them is not undermined by frustration, and so that peer learning is present through dialogue and cooperative work, promoting an affinity for nature and the motivation to participate in collective civic activities.

Keywords: sustainability; adolescence; environmental education; ecological perspective; environmental attitude; formal education; nonformal education



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1. Introduction

One of the objectives of environmental education, according to Boyes and Stanistreet [1], is to enable people to make informed decisions about their environmental behavior in order to protect the environment and nature. Since the 1970s, following the agreements contained in the Belgrade Charter, the result of the first International Seminar on Environmental Education, in 1975, new paradigms have been developed involving educating and enabling the public to make decisions allowing them to live in harmony and solidarity with everything around them and, according to the Treaty on Environmental Education for Sustainable Societies and Global Responsibility (Rio de Janeiro 1992), "Environmental Education is a political act, based on values, for social transformation" [2].

The Tbilisi declaration expounds that "Environmental Education must adopt a holistic perspective which examines the ecological, social, cultural and other aspects of particular problems. It is therefore inherently interdisciplinary" [3]. Our curricula often reflect archaic ideas about how the world should be, or used to be, rather than how it is today. It happens particularly with the climate destruction and the urgent need for environmental conservation [4]. Therefore, a transformative education that introduces new pedagogical elements in educational processes is necessary. Transformative education is based on learning "that aims to transform our existential understanding of humanity, including interrelationships both among humans and between humans and non-humans and the fundamentals of wellbeing" [5] (p. 1588). Ecopedagogy is one of the different pedagogies of transformative education, action-oriented through democratic dialogue to understand how environmental problems oppress the whole planet [6]. This way of understanding the

world implies that environmental education, in a social context of crisis and continuous change, requires a multidisciplinary worldview. Bonil et al. [7] incorporate the principles of complexity theory into environmental education. The first is the systemic principle, according to which “the world is comprised of a large multidimensional network in which there are continuous relationships between elements located at different scales” [8] (p. 201). The second is the dialogic principle, which brings together apparently antagonistic elements to understand the complexity of systems, and the third is the hologrammatic one, which emphasizes the system’s internal interaction.

The process of environmental awareness proceeds from this multidimensional vision and includes the affective dimension, composed of beliefs and values; the dispositional dimension, which represents personal attitudes; the cognitive dimension, where information and knowledge appear; and the active dimension, which has to do with proenvironmental behavior [8]. Along this line falls the concept of sustainability, where environmental and social justice issues are related [9]. According to Gericke et al. [10], sustainability is awareness of environmental phenomena produced by personal experiences, perceptions, beliefs, feelings, and actions [11].

This worldview and dimensions lead us to believe that environmental awareness is continuous, as reported by Kautish et al., and features different subscales, with its construction being based on three fundamental cornerstones [12]: knowledge, attitudes, and behavior [10,11]. When planning environmental education, the interrelation of subscales and dimensions must be taken into account. Some subscales with an important role are social approval for performing, or not, certain actions; belief in the efficacy of a behavior [13], concern, perception; and the intention to perform an action. Many studies conclude that awareness and concern for the environment are not necessarily reflected in conservationist behaviors, while emotional activity can influence them [14]. Others show that there is a gap between knowledge and proenvironmental behavior [15]. In addition, conduct may be more or less demanding in terms of modifying lifestyle patterns and, depending on the ease and comfort of modifying one’s behaviors, it may be more likely to be carried out [1].

Often, attitude and willingness to perform a certain action are measured. Attitude influences the individual’s behavior [16] and has often been used as an indicator of it. These values are determined by the biocentric dimension related to conservation, environmental protection, and risk control (preservation), and by the anthropocentric dimension, related to the use of natural resources (utilization) and associated with high-risk behaviors [17].

The active dimension is also measured from different angles. Action, from complexity theory, is defined as a method–strategy that is constituted as a continuous dialogue between theory and action [3]. As per Alisat et al. [18], often the term “behavior” is related to personal practices, but “taking action” goes a step further and is associated with participation in collective actions. Indeed, people who take collective action tend to have a strong environmental identity, with the environment playing an important role in their lives and constituting the motivation for their actions [19].

In studies on proenvironmental perception and behavior, behavioral intention is considered more than actual behavior [20]. Environmental perception consists of values and attitudes towards our natural environment and influences decisions to perform certain actions [21] and, thus, one’s proenvironmental behavior [22].

A multitude of tools have been developed that measure different scales. They can be examined in greater depth in the literature review by Mónus [20]: connection with nature and environmental identity; selfish, altruistic, and biospheric value orientation; feelings and behavioral intentions; the subscales of affection and verbal engagement; environmental regulation; awareness of consequences; and many more. Although there is a wide variety of scales, there is no consensus as to which tools to use to measure meaningful environmental behavior [23], ecological behavior, or environmental actions. Some examples of widely used tools [20] are the New Ecological Paradigm; its revised version, the New Environmental Paradigm [24]; and the Ecological World View. NEP is especially useful for adults [25,26]

and for environmental perception in children [27,28]. Other studies have evaluated the relationship between NEP and 2-MEV items in adolescents ages 10–16 [29,30].

Age and gender are sociodemographic factors that influence proenvironmental behavior. In fact, adolescents' climate change awareness can influence that of their families and friends, as shown in a study by Hiramatsu et al. [31], and vice versa [32]. Boyes and Stanisstreet [1] study how the cognitive basis is reflected in various behavioral factors, being potentially affected by education, concluding that there are students who perform actions when they are confident of their effectiveness in terms of environmental improvement. This is not true of all types of actions, however, as Rodriguez et al. [33] found that students aged 12 to 16 are willing to change habits when this is relatively easy, but not when the actions are more demanding [34]. There is a potential danger if environmental-awareness-raising begins before the receptivity stage, as people may suffer from environmental fatigue [35]. In relation to gender, girls have better scores than boys [36]—for example, in relation to environmental concern and believing in the effectiveness of actions [37], greater awareness of biospheric and altruistic values [38], and performing proenvironmental actions daily [1].

There are numerous environmental actions carried out in the educational field, but due to the specific context of this research, the educational innovation program called ALDEA, in which the educational centers of the study participate, is noteworthy. It is an environmental education program for the educational community developed by the Ministry of Education and Sports and the Ministry of Agriculture, Livestock, Fisheries, and Sustainable Development of the Junta de Andalucía. Its aim is to promote the integrated development of environmental education initiatives in the face of the current climatic emergency situation, the connection with nature and renaturalization of spaces, climate change, sustainable development, and the relationship between human beings and their social and natural environment that takes place in the educational centers of the city of Córdoba that have participated in this study [39]. Although this study does not intend to assess educational programs as ALDEA, some recurring obstacles can be highlighted, such as the lack of human resources and lack of time to develop it with quality.

As we have seen, attitude is a determining factor in environmental behavior, and its improvement should be an essential component of education. Thus, the aim of this study is to assess how the different components of environmental attitude influence secondary school adolescents, in order to improve environmental education plans and promote sustainability in formal and nonformal settings according to the most influential factors within the educational context. Regarding the serious environmental crisis, this type of research is essential for facing the current problems. In this sense, the study is focused on the near future, because knowing the environmental attitude of youths allows improving their education. These results will help to shape not only educational plans, but also the way environmental problems are conveyed and addressed, and the role of young people in their resolution.

2. Materials and Methods

2.1. Instrument

Based on the different variables and components mentioned above, this study will employ an instrument to evaluate the environmental attitudes or dispositional dimension [40] of young adolescents based on the concept of attitude advanced by W. Thomas and F. Znanieck in their work "The Polish Peasant in Europe and America", according to which the socioaffective component is composed of three factors [41–43]: the ideological or cognitive—that is, what is thought, ideas, knowledge, and convictions; the affective–emotional, which reflects concern for the environment; and the reactive–behavioral, or conative, related to action and thinking for or against, according to a personal norm in which responsibility for environmental problems is assumed and considered essential to take action. It also includes self-efficacy, regarding the ability to take actions to solve problems [44].

These three cornerstones of the socioaffective component coincide with the theory of complexity advanced by Bonil et al. [3] and what happens in the teaching–learning processes in science according to Sanmartí et al. [45], who posit that meaningful educational actions occur when the three dimensions are integrated and interconnected: what is done, thought, and felt.

The questionnaire designed and validated by Terrón et al. [46] was used to measure attitudes towards the environment in adolescents. It is a scale with 18 Likert-type items with five options: Don't agree/Never (1), Slightly agree/Almost never (2), Somewhat agree/Sometimes (3), Strongly agree/Quite a lot (4), and Totally agree/Always (5).

This scale was chosen because it meets the requirements of our study's population: designed for adolescents, written in Spanish, manageable number of items, and including both formal and nonformal situations ranging from personal to collective actions.

2.2. Sample and Data Collection

The sample comprised 346 people, 51% boys and 49% girls, aged 14, 15, and 16, with their respective percentages being 25%, 45%, and 30%. Data collection was carried out online in some classes, and in person in others, depending on the availability and preference of each school. The participants and school staff were informed and gave their informed consent before participating in the study.

2.3. Factor Analysis

The creators of the instrument [46] indicated the possibility of considering it unidimensional. They found five factors, but acknowledged their inconsistency and suggested that, in future research, empirical validity should be assessed using other factor analysis tests. Therefore, a semiconfirmatory FA was performed, applying ULS and direct Oblimin rotation, using the Factor program. After an analysis of goodness of fit, factor weights, and taking theory into account, we chose the three-factor model. The degree of adequacy for the factor analysis represented by the KMO was very satisfactory, with a value of 0.904, and with optimal internal consistency values—the Omega Coefficient being 0.916 and Cronbach's Alpha being 0.915. In addition, the distribution of items in three factors exhibits adequate goodness of fit. Table 1 shows the value of the factorial weights of each item. In the case of items 11 and 18, they are assigned to the factor whose factor weight is higher despite being included in other factors. However, item 17 is assigned to factor 3 for having theoretical coherence, although its factorial weight is lower. The distribution of items in three factors presents definitions of adequate goodness (GFI = 0.993; CFI = 0.991; NNFI = 0.990; RMSEA = 0.039 (0.0309–0.0396); RMCR = 0.0429).

Table 1. Results of the weights of the variables and the explained variance of each factor. The weights in bold are greater than 0.3 and assigned to the factor.

Items	F1	F2	F3
1. I wish there was a course on the environment in my academic program.		0.693	
2. I really want to participate in a class discussion about environmental conservation		0.466	
3. Working on a team in an environmental conservation activity makes me feel important.		0.521	
4. I would like to learn about the environment in all my courses.		0.821	
5. I wish more environmental conservation topics were covered in class.		0.725	
6. I think that more measures should be taken at my school in favor of environmental conservation.		0.330	
7. I like to learn through nature outings.	0.301		
8. It bothers me, during these outings, when litter is left outdoors.	0.639		
9. I would like to join an environmental conservation club or association that meets outside of class.		0.528	
10. I like to watch nature documentaries on television.			0.610
11. I would participate in a demonstration in favor of the environment.		0.307	0.393
12. I like to talk about the environment with my parents.			0.704
13. Nature conservation is one of my favorite topics.			0.732
14. I am concerned about the destruction of the environment.	0.838		

Table 1. *Cont.*

Items	F1	F2	F3
15. I admire volunteers who work for the environment.	0.576		
16. I feel responsible for environmental deterioration.	0.439		
17. Obtaining information about the environment is something I enjoy.	0.738	0.447	0.384
18. My behavior can help to improve the environment.	0.603	0.306	0.379

The development of the factors is balanced. Factor 1, the affective–emotional component, groups variables on civic, individual, and other people’s actions, where feelings are generated in relation to environmental concern and responsibility. Environmental emotion is intrinsic to environmental concern, whose development predicts environmental behavior [47,48]. Factor 2, the cognitive component, includes items that define knowledge motivation actions in the formal sphere. This is acquired through different social agents to learn about environmental problems and act in an environmental way. Factor 3, the reactive–behavioral one, includes items on behavioral intention, defined as the willingness to perform an action, considered as the main predictor or the variable immediately preceding [42] a given behavior.

3. Results

The mean response for each item, as shown in Table 2, demonstrates a great diversity of results. First, the standard deviation is greater than 1 in all cases, which indicates that there is great heterogeneity in the responses, such that the mean is indicative but not conclusive.

Table 2. Descriptive statistics and reliability measures.

Items	M	SD
F1. Emotional and affective. Alpha = 0.80; Omega = 0.80.	3.87	0.12
7. I like to learn through nature outings.	3.67	1.16
8. It bothers me, during these outings, when litter is left outdoors.	4.13	1.04
14. I am concerned about the destruction of the environment.	4.10	1.02
15. I admire volunteers who work for the environment.	3.95	1.12
16. I feel responsible for environmental deterioration.	3.02	1.13
18. My behavior can help to improve the environment.	3.74	1.11
F2. Cognitive. Alpha = 0.84; Omega = 0.84.	3.19	0.10
1. I wish there was a course on the environment in my academic program.	3.17	1.06
2. I really want to participate in a class discussion about environmental conservation.	3.03	1.16
3. Working on a team in an environmental conservation activity makes me feel important.	3.03	1.12
4. I would like to learn about the environment in all my courses.	2.65	1.12
5. I wish more environmental conservation topics were covered in class.	3.21	1.03
6. I think that more measures should be taken at my school in favor of environmental conservation.	3.47	1.05
F3. Reactive and behavioral. Alpha = 0.83; Omega = 0.83.	2.69	0.12
9. I would like to join an environmental conservation club or association that meets outside of class.	2.19	1.06
10. I like to watch nature documentaries on television.	2.66	1.30
11. I would participate in a demonstration in favor of the environment.	2.60	1.32
12. I like to talk about the environment with my parents.	2.59	2.45
13. Nature conservation is one of my favorite topics.	2.54	1.19
17. Obtaining information about the environment is something I enjoy.	2.97	1.16

With the SPSS Statistics 25 program, we analyzed the data in search of significant differences in the gender variable according to the factors. Based on the Kolmogorov–Smirnov test, the distribution of the sample is normal, but the Levenne test indicates that the data should be considered nonparametric. The results show that there are significant differences in the three factors and that girls had better scores.

To conduct a more exhaustive analysis of the significant differences, we performed the same operations taking all the items. Significant differences occur in 9 items, equally distributed between the three factors, with girls having better results than boys in all the

items except number 10. In Factor 1, the items deal with environmental concern (Item 18), admiration for other people who protect the environment (Item 15), and awareness of personal responsibility for environmental deterioration (Item 16). In Factor 2, the significant differences are found in Items 1, 4, and 5, where the desire to work more on environmental issues in the subjects is expressed. Finally, in Factor 3, Item 10 appears, where boys have a better score than girls, which refers to enjoying watching documentaries on television. The greatest difference is found in Item 11, F3, indicating that girls are more willing than boys to participate in demonstrations.

4. Discussion

The environmental attitude questionnaire in adolescents offered by Terron et al. [46] was replicated in the city of Cordoba with a similar sample size, but it is not possible to make major comparisons with respect to the original questionnaire for several reasons. The first is due to the factor analysis method used, and the second is because the study focuses on the Item Response Theory (IRT) developed by George Rasch [49].

The semiconfirmatory analysis carried out with the FACTOR program yielded three factors in tune with the socioaffective component on which the survey is based. The variables that predict a person's ecological behavior are knowledge, concern, values, and behavioral intention [34,50,51]. Transformative learning goes beyond the development of the mind [52]. In fact, critical thinking is related to the concept of "reflective learning", made up of three components: "identify and challenge assumptions; be aware of how context influences thoughts and actions; and develop and explore alternatives to existing ways of thinking and living" [53] (p. 257).

The affective component in relation to environmental responsibility and concern presents good numbers, constituting a good starting point, since once the affective system is activated, preventive action is much more likely [54]. Despite this, and the fact that many studies have shown that emotions play a central role in behavioral decision-making [55], this fact is not reflected in educational interest, and even less in behavior, confirming that knowledge is not the only element that influences environmental action [56]. Furthermore, [57] report that there is a slight decline in social responsibility values among adolescents. The reason for this disconnect between the affective, cognitive, and behavioral aspects is worth pondering. To do so, we will delve deeper into the subscales present in the factors.

The emotional factor includes items related to activities in nature and the emotional reaction generated by seeing deterioration wrought by other people. In relation to well-being in nature, some studies have shown a link between positive experiences in nature during childhood and proenvironmental attitudes [58]. This could be an element that also influences adolescents. Along this line, the findings of Krettenauer [59] confirm that proenvironmental attitudes and behaviors in adolescents improve with increasing exposure to and contact with nature. Yanniris [60] confirms the link between contact with nature and outdoor experiences during childhood with the environmental concern of adults. Meanwhile, evaluative emotions towards others, such as anger or indignation when seeing others violate a moral norm, are strong predictors of proenvironmental behavior. In addition, young people are receptive to other people's attitudes and behaviors towards the environment [61].

The environmental attitude survey focuses on the cognitive factor in the formal sphere: environmental courses, mainstreaming environmental issues in all subjects, teamwork in nature activities, etc. In this aspect, transformative learning reaches the deepest levels of knowledge to give way to transformative action that helps to achieve the Sustainable Development Goals [62]. Taking into account that today's students live in an era of globalized digitalization, schools must incorporate these sources and media (mass-media, social networks, etc.) where much of the information and knowledge is stored and accessed [61,62]. Transformative learning involves our understanding of our relationships with other humans and with the natural world [63,64].

The last component is behavioral. The action dimension, essential in transformative learning, implies the development of informed choices at personal, social, and political levels [65,66]. In other studies, it has been common to refer to proenvironmental actions that are carried out on a daily and individual basis. However, the Attitudes Towards the Environment survey that we applied focuses, on the one hand, on the motivation to learn formally, and, on the other, on voluntary participation in collective associations or actions. In the first place, there is a limited tendency to search for information, interest in discussing environmental issues outside the school environment, or in talking about environmental issues with their families. This fact is negative since the interpretation of the problem is the initial phase of the decision to seek information [67]. Thus, these data indicate a low-risk perception of environmental problems, and perception of risk is an element precipitating behavioral change [68], including, specifically, information seeking. Expanding information and knowledge contributes to awareness of the future impacts of current actions and is a key step to realizing that current actions and policies have long-term environmental consequences [54]. It is valuable to consider the findings of Mead et al. [69], who observed that adolescents who perceive grave risks due to climate change are more likely to seek information on their own than those who do not, and that parental influence is also key. In this regard, it is noteworthy that the only item where boys had higher scores was, precisely, motivation arising voluntarily to continue their education. However, environmental understanding does not translate in a simple way into an emotion that, in turn, generates action [70]. Students do not always understand the effectiveness of actions [71] or are not prepared to understand their impacts on health [72]. Sometimes, the actions proposed cannot be carried out by those in the age ranges in question, as the capacity to perform them has not been developed. In the words of [71], there is a risk that too much exposure to discouraging issues such as global warming may generate feelings of helplessness and demotivation to act for change [73]. A transformative pedagogy should contribute to the development of analytical skills related to the context of students [54]. At the beginning, we mentioned environmental fatigue in education, which may be related to the low scores in Factors 2 and 3; hence, highlighting the importance of educating students in how to use the media so that their learning contributes to a critical, selective, and active reception of all the information they receive through mass media.

In relation to the second focus of the behavioral component, the lowest figures were, precisely, on items involving civic behaviors that promote collective efforts with higher-profile actions and, therefore, ones of greater social cost [18]. While critical thinking and reflection is an essential prerequisite for transformative learning to occur, it is not by itself sufficient unless it results in transformative, sustainable, and responsible action [64]. Sometimes, the actions proposed cannot be carried out by those in the age ranges in question, as the capacity to perform them has not been developed. In the words of [71], there is a risk that too much exposure to discouraging issues such as global warming may generate feelings of helplessness and demotivation to act for change [70]. The contrast between the respondents' support for actions led by others, such as volunteer work on conservation issues, with a mean of 3.95, clashes in a striking way with participating directly in a demonstration, at 2.60, or being part of an association, which had the lowest score of 2.19. The greatest difference between genders came in one of the three items with the lowest scores: participating in a demonstration, where the score was 0.62 higher in girls. A study of the young Russian population found that although the majority indicated that environmental problems are acute and that the environmental situation in their city is worse than that of others, many were not willing to take responsibility for proenvironmental practices [64]. Although, as we have already mentioned, women tend to present better results in terms of their civic attitudes. In the same study by Shutaleva et al. [64], young women tend to think that everyone must comply with environmental standards. Tindall et al. [74] analyzed the contradictory effects, deducing that women are more participative, concerned, and committed, but are more limited by gender roles, restricting their activism.

Environmental activism [75] is a subtype of environmental behavior [23]. In fact, as Walsh [6] affirms that relational approaches to transformative education—in addition to advancing transformative learning—are key to supporting social justice goals. In contrast to this idea, other findings analyze how “individual characteristics are better predictors of proenvironmental behavior than environmental activism” [75] (p. 184). Nevertheless, according to Curtis, “students are learners, consumers, and citizens, and thus potential activists, able to mobilize political action to advocate for a cleaner environment and fairer societies” [76] (p. 10). Along these lines, Clayton [19] perceives that change happens individually, by performing individual acts. Dono et al. [75] call this type of action “personal practices”, entailing an individualization of the problem [18]. However, the importance of encouraging activism should be emphasized since collective actions play a key role in tackling environmental problems by combining a series of specific skills and abilities by which the individual becomes environmentally engaged [75]. International volunteering programs of proenvironmental practices seem to be effective since they can positively influence the acquisition of behaviors such as the habit of separating waste in Cambodian students after volunteering on environmental cleanup in another country [77]. Continuing with the idea of collectivizing actions, it should be taken into account that young people may feel overwhelmed by the difficulty of solving distant and complex environmental problems individually [78], and participation in collective forums channels this frustration. One way to enhance civic action is through education in media usage, especially the digital realm [79], as this can foster the development of competencies crucial to active, engaged, and participatory citizenship.

Therefore, any educational plan must contemplate civic collective actions that promote environmental activism. In this regard, the findings found by Robinson et al. [28] confirm the importance of emotional intelligence in young people in relation to proenvironmental behavior and attitudes, being much higher in adolescents able to manage, identify, and control their own and others’ emotions. They conclude that the role adolescents will play in the management of environmental problems as part of an active, decision-making populace is of vital importance, with the connection between proenvironmental attitudes and behaviors during this stage of evolutionary development being very important. Therefore, in addition to promoting critical thinking, students should also be encouraged to have heartfelt and sincere experiences, enhancing skills and values such as affection and empathy [80].

On the other hand, the objective of experiential learning [60] puts the focus on the students’ experience in finding solutions to real-life problems that affect local communities and is more effective in changing behaviors than knowledge-based learning. Further, Mezirow [81] defines transformative learning as problem solving by “defining a problem or by redefining or reframing the problem.” In this aspect, “the importance of keeping the local, but recognizing the global, is also an integral part of ecopedagogies” [5] (p. 9). Environmental education today plays an influential role in harmonizing the relationship between people and nature as a path for the survival of humanity [66]. Carmi et al. [56] suggest that, to foster environmental sensitivity, it is important to act in nonformal settings, while Stevenson et al. [82] cite the presence of other factors to encourage adolescents to expand their knowledge of climate change and invoke Vygotsky’s theories to highlight the importance of generating informal learning forums, such as discussion groups or group project work, where interaction between students encourages dialogue and debate, with learning being more effective in this way than with direct instruction by teachers.

The interdisciplinary nature of Environmental, Sustainability, and Global Citizenship Education is a challenge to the current educational system where the curriculum is organized into subjects that require “a kind of education that would encourage interdisciplinary cooperation and synthesis in its teaching and learning practices.” [60] (p. 8). As Odell et al. indicate [52], an element of transformative learning is questioning the frameworks in which education operates and aligns with the elements of transformative learning.

5. Conclusions

The improvement of environmental attitudes in adolescents is an educational challenge; so, it is necessary to reconsider our methodologies and perspectives through which to generate transformative educational processes. To this end, it is important to take into account the affective component through a more heartening presentation of the actions that can be carried out, both at a personal level and as a society. The analysis carried out of young adolescents' attitudes towards the environment at secondary schools in the city of Cordoba offers some conclusions in this regard.

This research study concurs with the findings of other studies containing arguments asserting the importance of exposing youth to these problems and solutions, showing them how they are related to their lifestyles and how change improves their leisure time, health, and peer relationships. It is important to promote knowledge and awareness of environmental issues. Acting in one's immediate environment constitutes an opportunity for youth to appreciate their transformative power regarding environmental issues. This points to the need for educational interventions to link environmental commitments to their personal daily lives—that is, not only formal settings, but also nonformal and informal ones. Combined with this idea, it is essential to carry out more activities in nature, integrating them into relationships between peers to make them socially rewarding.

We conclude by pointing to the importance of some elements that should be taken into account in future transformative environmental education interventions. Firstly, incorporate external educational agents in the formal sphere. This translates into, on the one hand, the greater prevalence of extracurricular activities, educational programs, and/or awareness campaigns by other social agents within schools where the formal and nonformal spheres complement each other and serve as support when it comes to achieving the objectives of the programs, dedicating more time to it, but in a shared way with the teaching staff and other institutions. On the other hand, this leads to incorporating activities with families through school groups such as PTAs and alumni associations, etc., which can also come from the agents mentioned above. Secondly, encouraging group work, debates, and forums for dialogue among equals, both inside and outside the classroom. This entails carrying out more experimental and experiential teaching–learning processes, with global analyses of the environmental situation, but seeking local solutions that can be developed by the students in a participatory, collective, and open-air way. Finally, emotional education should be considered in a transversal way, as it prevents possible frustration in the face of the potentially overwhelming environmental challenges of today and tomorrow, so that people can avoid resignation and channel their energies into transformative, collective actions, keeping in mind the idea of transformative education: “think globally, act locally”. The aim is to turn frustration and indignation into motivation to find alternatives that can be carried out by young adolescents in their daily lives and to encourage youth to organize and become transformative agents. In short, the aim is to promote community schools open to different socializing and influential agents in adolescents' educational processes, establishing communicative and educational strategies in relation to environmental problems, avoiding paralyzing catastrophism and encouraging transformational attitudes.

Once the methodological keys to improve environmental education for adolescents are known, it is necessary to review and evaluate the scope of environmental education programs specifically in order to integrate improvements and to give continuity to the achievements.

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