Environmental education in the classroom: pilot study in Cabo Verde suggests differing impacts on students' local knowledge and environmental attitudes.

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Abstract

To execute environmental education effectively, the success and impact of educational activities must be assessed. In areas of high biodiversity, there is a lack of impact evaluation of environmental education. This study investigates the effect of a one-time classroom activity on students’ knowledge of local environmental issues, environmental attitudes, and future aspirations. The project was conducted on the island of Maio, Cabo Verde, a small, highly biodiverse island, as part of a classroom visit program with the local environmental organization, Maio Biodiversity Foundation. We visited every 4th grade class on the island (n = 142 students) and delivered a half-day classroom activity. The results showed that this classroom activity did not influence environmental attitudes, however it did significantly improve students’ knowledge and awareness of local environmental issues. This study shows that environmental education should not be assumed to automatically improve attitudes and knowledge, but requires individual evaluation for each type of activity. For environmental education to reach its full potential, activities should be carefully planned in response to evaluation results to achieve the desired objectives.

Keywords: Environmental education, Attitudes, Knowledge, West Africa, Evaluation, Conservation.

Introduction

Earth’s biodiversity is diminishing at an alarming rate. Over the past decade the IUCN has declared that over 160 species have become extinct, and over 38,500 species are threatened with global extinction, according to the Red List (IUCN. 2021). Anthropogenic activities such as pollution, over-exploitation of natural resources and habitat destruction are threatening the future of plant and animal species, including our own (Ramírez and Santana. 2019). The destructive
practices that lead to environmental problems are often authorized and encouraged by a lack of knowledge and respect for the environment, ultimately caused by inadequate environmental education (Valderrama-Hernandez et al. 2017).

As advancements in technology continue, and urbanization of the world is rapidly increasing, children’s exposure to the natural world has decreased, referred to as the extinction of experience (Pyle. 1978). In 2016, a study concluded that 12% of children participating in a UK survey spent 12 months without visiting a natural area (Hunt et al. 2016), and a study by Ballouard et al. (2011) showed that while school children could only identify 39.9% of local species presented, they could identify 46.6% of exotic species, implying a disconnect from local biodiversity. The need to reconnect society back to nature is apparent, and it is particularly important for the younger generation. Childhood is the optimal stage to undertake environmental education, with younger children being more receptive to environmental attitude changes than adults and even teenagers, as once formed, environmental opinions become increasingly more difficult to sway (Kellert. 1985, Caro et al. 1994, Damerell et al. 2013, Liefländer and Bogner. 2014).

Therefore, implementing environmental education in schools is an ideal system to increase pro-environmental behavior amongst society. It is often assumed that parent-child teaching is unidirectional, with the parents teaching their children the attitudes and knowledge that they possess, however studies have shown that children can impact the values and knowledge of their parents too (Vaughan et al. 2003, Damerell et al. 2013). This bidirectional influence between adults and children at home gives environmental education the potential to be a very powerful tool to increase knowledge and positive attitudes towards the environment across younger and older generations.
Environmental education does not have one simple definition. Environmental education consists of a plethora of activities to raise awareness of environmental issues, encourage positive attitudes towards nature, increase knowledge both of and about the environment, and highlight key problem-solving skills to allow identification of solutions to environmental problems (Lucas, 1979, Edsand and Broich, 2020). This type of education is essential to slow the inflated loss of global biodiversity that we are presently experiencing (Ruiz-Mallen et al. 2009). Biodiversity conservation is dependent on the understanding of threats to ecosystems, and the workings of ecosystems themselves (Kassas, 2002, Lanjouw, 2021). It is crucial that local communities become part of conservation efforts, and this all starts with environmental and conservation education (Ardoin et al. 2020).

Environmental education is a wonderful tool, with many effective projects being undertaken across the globe (Ruiz-Mallen et al. 2009, Ortiz et al. 2018, White et al. 2018, Spooner et al. 2019, Karris et al. 2020). However, due to its many favorable benefits, environmental education can often be thought of as an all-round general solution to many different environmental problems, without clearly defining goals or critically assessing the activities undertaken (Edsand and Broich, 2020). For environmental education to reach its full potential, its impact must be evaluated. An increased understanding of the impact of environmental education can improve the efficacy of the education itself and can also help to further improve policies and programs involving the environment, practices for sustainable development, and environmental career prospects of participants (Kassas, 2002). The change in environmental attitudes, knowledge acquisition and even career trajectories should be monitored and assessed, often done by case studies focusing on a particular environmental education (Borchers et al. 2014). However, these evaluations are predominantly occurring in the USA and Europe (Stern et al. 2008, Kossack and Bogner. 2012, Koutromanos et al. 2018, Spooner et al. 2019).
However, in areas of the world that often contain higher levels of biodiversity, such as West Africa, there appears to be a lack of environmental education evaluation (Kuhar et al. 2010, Borchers et al. 2014). Due to the increasing appearance of conservation foundations, predominantly non-governmental organizations (NGOs), environmental education is increasing in Africa, however there is scarce literature showing any evaluation of these projects (McDuff. 2000, Carelton-Hug. 2010, Borchers et al. 2014, Leeds et al. 2017, Velemmini. 2018). Additionally, it is not known if the differing cultures, social and educational systems, and environmental circumstances are taken into account whilst implementing these educational activities, as the differences between Africa and Europe/North America question the assumption that the same environmental education strategies will have the same effect, so that the results of any environmental education evaluation undertaken in Europe/North America may not be applicable in Africa (Bettinger, 2010, Borchers et al. 2014, Lanjouw, 2021).

This study aims to add to the limited publications evaluating the impact of environmental education in West Africa. The island of Maio, Cabo Verde, was used as a case study, and the impact of a one-time classroom intervention undertaken by the local conservation NGO Maio Biodiversity Foundation was evaluated across all 4th Grade classes (n = 10 classes) on the island. The objectives of this evaluation were to investigate if and how a single exposure to environmental education in the classroom could influence 1) attitudes towards the environment, 2) knowledge acquisition of local environmental problems, and c) future aspirations regarding career and studies.

**Study Area**

Cabo Verde is an archipelago consisting of ten islands, approximately 600 km west of the coast of Senegal, West Africa. The island of Maio (15°13’ N, 23°10’ W) is one of the smallest of the nine inhabited islands of Cabo Verde, with an area of 269 km² and a population of approximately 6980 inhabitants (Instituto Nacional de Estatística de Cabo Verde 2015). Cabo Verde is home to a vast
array of marine fauna, flora, and endemism. The island of Maio is home to a wide range of this biodiversity, including some of the endemic bird taxa of Cabo Verde: Iago sparrow (*Passer iagoensis*), Bourne’s heron, (*Ardea purpurea bournei*), Alexander’s swift (*Apus alexandri*) and Cream-coloured courser (*Cursorius cursor exsul*) (Rice et al. 2020). Maio is also home to the largest, resident breeding population of Kentish plover *Charadrius alexandrinus* in the Macaronesian archipelagos (Engel et al. 2020, McDonald et al. 2021). Maio hosts a range of sea turtle species during the reproductive months of June – October, including Olive Ridley (*Lepidochelys olivacea*), Green (*Chelonia mydas*), and is one of the three Cabo Verde islands with the largest nesting colonies of Loggerhead (*Caretta caretta*) (Lopes et al. 2016, Patino-Martinez et al. 2022). Maio consists of thirteen distinct communities, split into four zones, containing eleven primary schools. This study focused on 4th grade students, with the age range of 9-10 years old (n = 142 students). Due to the small population size of some rural communities in Maio, 4th grade students were condensed into 10 classes distributed across 8 schools. The content taught was relevant to the island’s largest wetland, the “Salinas do Porto Inglês”. This is a RAMSAR site of approximately 535 ha (Oliveira, 2013, Pereira, 2016), containing saltmarsh, grassland and semi-desert habitats and home to a variety of biodiversity, including the aforementioned bird and turtle species.

**Methods**

**Environmental Education Intervention.**

From the 18th-25th May 2021 we collaborated with Maio Biodiversity Foundation and visited every 4th grade class on the island of Maio (n = 10). At each school, we (Romy Rice and Herval Silva) delivered a two hour long environmental education intervention. The researchers took control of the session, however the teacher stayed present in the classroom to assist with any issues, such as discipline. The topic of the intervention was “Ecosystems in Maio”, and we used local examples to show the impact of human activity on ecosystems, both detrimental (threats...
such as litter and vehicles) and beneficial (conservation work such as turtle patrols and beach
cleans).

First, we introduced the topic of ecosystems in a 10-minute presentation about the different types
of habitats found in Maio, and the species in each ecosystem. The focus was on the protected
area “Salinas do Porto Inglês”, the island’s largest wetland and terrestrial biodiversity hotspot.

For this chosen ecosystem, the class discussed what kind of species were present, and what the
ecosystem consisted of, including both biotic and abiotic components. For every organism
suggested, the class discussed what that organism depended on, therefore starting to make links
between ecosystem components. We then helped the students create an ecosystem network,
containing all organisms that were suggested, and all the connections discussed. We identified
threats to the ecosystem, and we used 5 key examples for the activity: 1) quad bikes, 2) illegal
sand extraction, 3) too many people, 4) litter, and 5) hotel construction. We then recreated this
ecosystem with the children. Every child represented part of the ecosystem e.g., species of birds,
turtles, plants, water, and sand, by using cartoons on paper. The connections between ecosystem
components were represented by holding a rope. Depending on the classroom size, some
children represented the suggested threats, also with cartoons. The five threats were presented,
and for each threat we discussed what kind of problem this threat generated for an organism or a
connection. If a connection (rope) between the organisms (children) was broken by the threat, the
rope was placed on the floor. All threats were presented until all the ropes were on the floor,
therefore the ecosystem was ruined. After the activity, we held a group discussion to talk about
the work of Maio Biodiversity Foundation and discuss what we can all do to prevent threats from
destroying local ecosystems.

Questionnaires
We designed a questionnaire to evaluate the environmental attitudes, future aspirations, and knowledge of local environmental issues of 4th grade students before and after the environmental education intervention (Supplementary material 1 & 2). The questionnaire consisted of fourteen statements with a 1-5 Likert scale (1= strongly disagree, 5=strongly agree), and three open ended questions, categorized into 5 groups (1. Science, 2. Animals, 3. Litter, 4. Future aspirations and 5. Knowledge of local environmental issues). We developed the questionnaire in English, then translated it into Portuguese, and the final edit was undertaken by a Cape Verdean with experience in schools, to ensure that the questions and language were appropriate and understandable. In the results section for questions regarding future aspirations the acronym “FMB” refers to Maio Biodiversity Foundation. We applied the questionnaires immediately before the intervention, and one week after. In total, 131 students filled out at least one questionnaire, however nine students were absent for one of the two applications, therefore 122 students filled out both pre- and post-activity questionnaires. We excluded the nine students that only filled out one questionnaire from the analysis. Students’ identities were kept anonymous, using a numbered system rather than full names.

Analysis

The first fourteen quantitative statements were scored 1-5 and the last three questions were open ended. These open questions were interpreted by one independent researcher and converted into a score between 1-5. The highest score of five represented a complete answer showing full comprehension of the question. The lowest score of 1 represented no useful answer, an incorrect answer, or no understanding of the question. Two of the statements implied a negative opinion, 1) “I find science boring” and 2) “I leave my litter on the floor”, therefore the scores for these were reversed for analysis. For each group of statements (1. Science, 2. Animals, 3. Litter, 4. Future aspirations and 5. Knowledge of local environmental issues), we applied a Multivariate Mixed Model analysis to assess the effect of the intervention. The relationships between the
dependent variables (Scores of questions) and 3 fixed independent variables (School, Gender, Intervention) were investigated, with the Student ID as a random effect. To determine the effect of gender and school on students’ learning, the difference in scores were calculated before and after the intervention, and a two-way multivariate analysis of variance (MANOVA) was conducted on these differences. Gender and school type were the independent variables, difference in score per question were the dependent variables.

All statistical analyses were performed using R studio version 4.1.3 (RStudio Team. 2021). Data were visualized with package ggplot2 (Wickham 2016) and models used the package lme4 (Bates et al. 2015).

**Results**

Exposure to the environmental education intervention (variable “Intervention”) was the most influential variable on the questionnaire outputs (Tables 1). The scores of eleven out of seventeen statements and questions significantly differed before and after the intervention, and nine varied between schools. Responses did not vary between the genders.

**Opinions regarding science**

The statement “I like science lessons” was significantly affected by both “Intervention” and “School”. The students stated they liked science lessons less after the intervention, however students from the school of Morro scored this statement significantly higher compared to other schools. Interestingly, students scored higher for the statement “I want more science lessons at school” after the intervention. The intervention did not affect students’ scores for “I find science boring”, although students from the school Figueira and Calheta scored this statement significantly higher in comparison to the other schools (Table 1).
Opinions about animals

Of the five statements regarding opinions towards animals, only one, “Animals are important.” was positively affected by “Intervention” or school. The statement “I want to learn more about animals” scored higher in the school of Morro, and the statement “I like seeing different animals on T.V and in books” scored higher in two schools (Pilão Cão and Morrinho) (Table 1).

Opinions about Litter

All three statements regarding litter were affected by “Intervention” and two statements were affected by “School”. The statements concerning litter dropping “I always put my litter in the bin” and “I leave my litter on the floor” were both negatively affected by the intervention, with students admitting to dropping litter more after the intervention. These two statements were also affected by school, with “I always put my litter in the bin” scoring higher in two schools, and “I leave my litter on the floor” scoring higher in five schools. However, students also admitted to more feelings of sadness when they see litter in the street or the beach after the intervention. (Table 1).

Opinions about future aspirations

The two statements related to becoming involved with conservation activities “I want to work with the environment” and “I would like to volunteer with FMB one day” were both positively affected by the intervention. The statement “I would like to volunteer with FMB one day” was affected by “School”, with one school (Morro) showing overall higher scores compared to the others (Table 1).

Knowledge of local environmental issues
Scores for all three questions about local environmental issues significantly increased after the intervention. Additionally, two of the questions were affected by “School”, with schools Morrinho, Figueira and Calheta, showing higher scores than other schools (Table 1).

**School**

Overall environmental opinions and knowledge differed between schools; for nine out of the seventeen questions, responses significantly varied between certain schools. For five out of those nine questions, the school of Morro had significantly higher scores. The only school that did not show significantly higher or lower scores for any question was Barreiro. The other schools all showed significantly higher or lower scores for at least one question.

The two-way MANOVA results indicated a statistically significant difference in students’ learning between schools; Wilks’ Lambda = 0.0496, F = 1.33, p = 0.02949, however no difference between genders. Specifically, three of the seventeen questions showed a significant difference in learning between schools; “I always put my litter in the bin”; F = 2.989, p = 0.00975, “I like animals”; F = 2.395, p = 0.0324, and “What are the environmental problems in Maio?”; F = 2.805, p = 0.0142.

**Discussion**

This study provides four main results. First, the scores of most statements regarding environmental attitudes and actions were not immediately improved by the one-time exposure to the environmental classroom activity that this study presented. Second, questionnaire responses suggested that students seemed more willing to get involved with environmental activities in the future soon after the intervention. Third, the intervention significantly increased students’ knowledge of local environmental issues. Fourth, students’ attitudes and learning are dependent on the type of school they attend. Overall, we can conclude that this study highlights the necessity of evaluations of environmental education and suggests that environmental education
cannot be assumed as a general solution, but rather as a tool that requires careful planning much
like any other conservation action.

The majority of statements regarding attitudes towards science lessons, litter and animals did not
show a significant change in score after the environmental education intervention. Although the
scores suggested that students would like more science lessons, they did not suggest that students
liked science lessons more after the intervention. This mixed response also applied to the
statements regarding litter. Scores revealed that after the intervention students felt more aversion
towards seeing litter in the streets and at the beach, however showed higher levels of litter
dropping. Finally, of the five statements regarding attitudes towards animals, just one increased
in score after the intervention, with the rest not affected. Therefore, of the eleven statements
regarding environmental attitudes and actions, only three positively increased in score after the
intervention. It is often assumed that environmental education encourages more positive
environmental attitudes, due to the encouraging responses of some programs (Armstrong &
Impara. 1991, Farmer et al. 2007, Ruiz-Mallen et al. 2009). However, this study suggests that
this is not always the case. This could be due to the fact that this was a one-time exposure
activity. Several studies that have shown to improve environmental education attitudes were long
term programs, or at least had a higher exposure rate than just one occasion (Volk & Cheak.
2003, Hsu. 2004, Ruiz-Mallen et al. 2009). Although there have been instances of one-time
exposures to environmental educational activities making a difference (Farmer et al. 2007,
Spooner et al. 2019), a one-time classroom educational intervention or activity such as this study
may not be sufficient to change the students’ opinions about science lessons in general, or their
overall attitude towards littering and animals. Perhaps the intervention design itself was not
optimal, or simply more exposures are necessary to generate attitudinal changes. This result
highlights the importance of evaluating all types of educational activities, as the outcome may
not be the positive influence that is commonly expected.
However, these mixed responses to statements regarding environmental attitudes could reflect a fault in the study design. Self-completion questionnaires are often used as an effective method of data collection for large study samples, as this format allows for honest responses due to the anonymity of the set-up (Strange et al. 2003). However, for this particular study, the use of questionnaires could have been a limitation of data collection. Young students may struggle to understand complicated questionnaires and therefore shorter, simpler questionnaires are recommended for younger age groups. However, by creating a toned-down questionnaire for ease of use of younger students, we may reduce the power of this data collection method. The use of questionnaires with children might also have produced issues with honesty whilst answering certain questions. For example, students may have felt pressure to answer in a certain way if they felt that the questionnaire was in the format of an exam. Although researchers explained that this was not an exam, the first statement was “I like science lessons”, therefore young students may have felt pressure to give a higher score than what they may honestly be feeling. The same theory could apply towards the statement that require a certain level of honesty, such as the statements regarding litter dropping. During the first round of questionnaires, students may have felt compelled to put more socially desirable answers (Milfont. 2009), due to the presence of the local conservation NGO in their lesson. Once they had done the activity and realized that this was in fact not an exam, they may have felt more relaxed to answer sincerely. In future studies, perhaps these “honesty” type statements are not the optimal way of assessing views, and it may be better to use a more subjective method, such as interviews or even personal observations (Jahedi & Méndez. 2014, McIntyre & Milfont, 2016).

The second finding of this study was that after the intervention, students’ aspirations about getting involved with the environment seemed to positively increase, however children did not feel more inclined to continue to study science. This result reinforces the link between effectual
environmental education and interest in conservation. A limitation of this study is the small
simple questionnaire used to collect data, therefore there were only two statements regarding
future environmental activities. Nonetheless, the response to both statements significantly
increased after the intervention; children were more inclined to want to volunteer with Maio
Biodiversity Foundation and think about working with the environment. This may be since
outside organizations entering schools often present new ideas and a change to the usual
curriculum, and therefore can motivate children to get involved more than usual classroom
activities (Fitzakerley et al. 2013), however, to fully support this conclusion a larger number of
questions would be necessary. Future studies could also include the use of a control group that is
not exposed to an external intervention, therefore assessing the effect of the presence of an
organization within a school.

The third major finding of this study was that students’ knowledge regarding local environmental
issues significantly increased after the intervention. All three questions regarding local
environmental issues significantly increased in score after the intervention, and considerably
more than the other attitude-based statements. Many students’ responses also included extra
details, showing not just memorization of the information taught, but understanding too. For the
question “What are the environmental problems in Maio?” after the activity, many students
listed the five threats mentioned in the activity: 1) quad bikes, 2) illegal sand extraction, 3) too
many people, 4) litter, 5) hotel construction, however there were numerous instances of students
reinforcing their answers with extra details, such as “quad bikes making water and sand dirty”,
and “quad bikes destroying bird nests”. Additionally, some students included the five mentioned
threats, and extra threats that were not mentioned in the activity, such as “people killing
animals”, “driving cars through protected areas” and “turtle poaching”. These extra details
suggest that students were able to learn information taught but also apply their knowledge to the
question after the activity.
These results suggest that this type of classroom environmental education is most powerful when targeted towards teaching information, and knowledge retention, even if it may not necessarily spark interest or change opinions. This information can then be used to plan out environmental education specifically aiming to improve learning. However, a limitation of this result is that it is not known how long the information was retained for. The follow-up questionnaires were undertaken 1 week after the intervention; however, we do not know how long students preserved the information they learnt for long term. Future studies could perhaps include not just a 1-week follow-up, but also a 1-month or even a 1-year follow-up.

The fourth result of this study was that although intervention was the most influential variable overall, the school that a student attended also affected the responses to some statements. There did not seem to be a directional trend, and the schools that affected scores depended on the topic of the question. Overall, the school of Morro provided higher scores for five of the nine questions affected by school, however these are spread over the topics of all five groups of questions, making it difficult to draw any conclusions regarding the effect of school. However, Morro had a class size of just seven students and some studies suggest that smaller class sizes improve learning (Fogarty. 2012, Altinok & Kingdon. 2012.). However other literature suggests that class size alone is not enough to affect learning outcomes, but rather a mixture of socioeconomic factors (Hattie. 2005, Köhler. 2022.) Additionally, the effect of “School” could relate to the particular location of that school, rather than the school itself. Morro for example is a small village, and more rural than some other communities in Maio. This may be a limitation of the study design, as some sample sizes of individual schools are very small, therefore confounding factors may affect the outcome, such as the culture of the village, teacher, or home life. More research is required to investigate the specific effect of school on environmental attitudes and knowledge.
To conclude, this study has shown that evaluation is crucial in understanding the impact that educational activities have on student knowledge, environmental attitudes, and future aspirations. This one-time classroom activity was successful at increasing students’ knowledge of local environmental issues, as well as raising their awareness of solutions to the problems, however it was not effective at improving environmental attitudes. Although this study was small and simple, the results do suggest that environmental education is not a general solution to the array of environmental issues that the world is facing, but in fact a technique that needs careful planning and judgement. Environmental education has the potential to be a powerful tool in conservation, however it should be assessed and organized like any other environmental action. To expand and solidify the conclusions drawn from this study, we suggest developing a more complex questionnaire in combination with subjective observations, or using a different data collection method, such as interviews. Additionally, adding another follow-up to the study design, such as after one month or one year, would help clarify the effects of environmental education. To access the full potential of environmental education, future work is necessary to further evaluate the effect of other types of activities, such as those that take place outside of the classroom.

Author contributions

RR and TS developed the concept of the paper. RR, HS, JA and NE developed and participated in the educational intervention. RR conducted the statistical analyses and wrote the first draft of the manuscript. RK and MH provided advice on concepts, analyses and supplementary figures. All authors contributed to edits and preparation of the final manuscript.

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Conflicts of interest

None

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Ethical Standards

Maio Biodiversity Foundation was granted full clearance to undertake this study in the 4th grade classes across schools in Maio by Maria Ribeiro, the education delegate of Maio. This research abided by the Oryx guidelines on ethical standards. Students’ identities are kept anonymous in the dataset. The objectives and implications of the research were explained to the students and staff members, who provided freely consent for their participation.

References


Table 1. Multivariate mixed model output testing the effect of “Intervention” and “School” on scores of statements regarding “Science”, “Animals”, “Litter”, “Future aspirations” and “Local environmental issues”. Table 1 shows the corresponding significant variables, estimates, t-values and p-values. The non-significant variable “Gender” was removed from the models.

Corresponding degrees of freedom: 548, 995, 542, 514, and 548.

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<td>“Intervention” (After)</td>
<td>-0.281</td>
<td>-2.250</td>
<td>0.025</td>
</tr>
<tr>
<td></td>
<td>“School” (Morro)</td>
<td>0.840</td>
<td>2.486</td>
<td>0.013</td>
</tr>
<tr>
<td>I feel sad when I see litter in the street or the beach</td>
<td>“Intervention” (After)</td>
<td>0.395</td>
<td>2.785</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I leave my litter on the floor</td>
<td>“Intervention” (After)</td>
<td>-0.385</td>
<td>-3.191</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>“School” (Pilão Cão)</td>
<td>1.452</td>
<td>3.241</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>“School” (Morrinho)</td>
<td>1.217</td>
<td>2.957</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>“School” (Liceu)</td>
<td>0.649</td>
<td>2.107</td>
<td>0.036</td>
</tr>
<tr>
<td></td>
<td>“School” (Figueira)</td>
<td>0.838</td>
<td>2.092</td>
<td>0.037</td>
</tr>
<tr>
<td></td>
<td>“School” (Polivalente)</td>
<td>0.690</td>
<td>1.979</td>
<td>0.048</td>
</tr>
<tr>
<td><strong>Future aspirations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I want to continue to study science</td>
<td></td>
<td>No significant variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I want to work with the environment</td>
<td>“Intervention” (After)</td>
<td>0.405</td>
<td>3.003</td>
<td>0.003</td>
</tr>
<tr>
<td>I would like to volunteer with FMB one day</td>
<td>“Intervention” (After)</td>
<td>4.674</td>
<td>4.674</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>“School” (Morro)</td>
<td>0.805</td>
<td>2.054</td>
<td>0.040</td>
</tr>
<tr>
<td><strong>Local environmental issues</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What are the environmental problems in Maio?</td>
<td>“Intervention” (After)</td>
<td>1.583</td>
<td>14.035</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>“School” (Figueira)</td>
<td>1.312</td>
<td>4.693</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>“School” (Morrinho)</td>
<td>1.137</td>
<td>3.839</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>“School” (Calheta)</td>
<td>0.839</td>
<td>3.656</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>“School” (Pilão Cão)</td>
<td>1.104</td>
<td>3.549</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>“School” (Morro)</td>
<td>0.747</td>
<td>2.412</td>
<td>0.016</td>
</tr>
<tr>
<td>How can we help the environment every day?</td>
<td>“Intervention” (After)</td>
<td>0.644</td>
<td>7.492</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>“School” (Morrinho)</td>
<td>0.980</td>
<td>3.999</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>“School” (Figueira)</td>
<td>0.596</td>
<td>2.561</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td>“School” (Calheta)</td>
<td>0.420</td>
<td>2.205</td>
<td>0.028</td>
</tr>
<tr>
<td>Statement/Question</td>
<td>Variable</td>
<td>Estimate</td>
<td>t-value</td>
<td>p-value</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------</td>
<td>----------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Who is responsible for taking care of the environment?</td>
<td>“Intervention” (After)</td>
<td>1.356</td>
<td>8.699</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>