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Letter from the editors

Thank you for reading this edition of Canopy and the final issue from the 2021-22 cohorts of MSc in Primate Conservation and the MRes in Primatology and Conservation here at Oxford Brookes University. The theme of this issue is conservation education and outreach. We chose this topic because of the significant and important role education plays in conservation, by engaging people from various backgrounds with these issues and by inspiring the next generation of conservationists. In this issue, we bring together studies from Asia, Africa, and Europe exploring education initiatives, strategies, and their role in conservation and learning about it. Education is an important aspect in all conservation issues and should be considered in approaches to protect not only primates but all wildlife and the habitat they share with humans.

Education is important to us editors as it is the reason we are all here at university, to learn and improve our own skills to be able to make a difference in the world of conservation and maybe become the next generation of educators. We are grateful for the knowledge we gained in this programme and the knowledge that led us all the way here, and it is our responsibility to pass it on to others.

Thank you to all the staff on this course who work hard to keep it running, particularly for organising field trips and the Monday evening seminar series which have gone ahead in-person following it having been online only for the previous year. As our cohorts begins their dissertation projects, we want to wish everyone success, good luck and safe travels.

Please enjoy this issue,

The Editors (Emily, Charlotte, Hannah & Evelyn)

Evaluating the process of creating environmental education resources

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Environmental education is needed to help the public access and understand scientific research, it can be used to increase knowledge, improve attitudes and implement behavioural changes. Species that are perceived as 'likeable' often have a high-value placed upon them and so evoking affection through environmental education can increase public support for species protection (Tisdell *et al*., 2006). The African Primate Program (APP) was created to provide free online environmental education material for secondary school teachers and educators. The program provides three courses that can be taught independently of each other: Nature, Primates and Coexistence. The resources can be found online on the Cycle for Africa webpage (https://cycle4africa.org.uk/). The purpose of this paper is not to evaluate the success of the APP but to analyse the planning-implementation-evaluation (PIE) framework, described by Jacobson and colleagues (2015), used to create the APP.

Before creating an environmental educational resource some questions need to be addressed irrespective of the type of resource going to be created (known as the planning stage). Firstly, do the goals of the program support the organisation? If the answer here is no then either the goals should be changed or another organisation be chosen to host the materials. It is strongly advised to talk to organisations before the creation of the resources and to come to an agreement about what information to include in your resources. Charities are excellent organisations to contact as they often have broad mission statements.

Once the goals of the environmental education program have been highlighted the next step advised in the planning stage is to identify the target audience (Jacobson *et al*., 2015). There are currently no guidelines about which age group to target when trying to encourage a connection to the environment (Liefländer *et al*., 2013). On one hand, children are targeted, as childhood experiences can form life-long attitudes and behaviours (Braun *et al*., 2018); however, children do not always have the power to initiate changes. The target audience chosen should depend heavily on the goals of your education program and once they have been chosen, they should be included from the planning stage. Before this contact is made, background research should be done on your chosen audience. When working with children, such as in the APP, the simplest way

of doing this is to read the National Curriculum to understand the audience's educational background. This is very important when creating school resources as including topics that are already on the curriculum is advantageous for teachers who have little time to teach extra-curricular courses. Difficulties do arise when creating resources that are to be used across multiple countries due to the inconsistency of environmental education taught globally (Jacobson *et al*., 2015). To combat these differences multiple curricula should be consulted (a minimum of four is recommended) to ensure elements from multiple curricula are incorporated into the program.

As part of the research into the background of a target audience, the attitudes towards the issue should be addressed. Interviews, public meetings, workshops and surveys are all ways in which to include the target audience (Jacobson *et al*., 2015). In the APP creation, semi-structured interviews were used. Interview questions were prepared by first reading through the academic literature about people's perceptions of primates. It is important to choose relevant interviewees who have experience in the subject area (in this case biology/life science teachers and environmental educators were interviewed). As the APP was to be a global program the use of Zoom, or other similar platforms was advantageous as it allows for contact to be made with people worldwide. One of the disadvantages of interviews can be interviewees saying what they think you want to hear. In this process, I found by first stating there were no right or wrong answers at the beginning of the interview process and asking neutral questions (e.g. 'what resources do you use to teach') opposed to leading questions (e.g. 'do you use technology to teach?') was a good way to prevent this.

The next step in the PIE framework is implementation. At this stage Jacobson and colleagues (2015) suggest pilot testing the activities and looking at the program operations. In terms of the program operations, the APP had no budget or staff as it was to be distributed online and taught by teachers. Final decisions were made on the educational techniques used (such as games) and the resources were piloted. Due to coronavirus and school closures, the APP was unable to be trialled in schools. Instead, teachers and environmental educators (who control the target audience's access to the resources) were sent the teaching materials and a feedback sheet. Formative feedback allows for the program to be improved before being distributed which increases the likelihood of the program goals being achieved (Norris & Jacobson, 1998; Carleton-Hug & Hug, 2010). Although in future it is advised to trial the resources in a classroom, obtaining feedback from educators is an excellent alternate option. The use of open-

ended questions allowed informants to fully explain what modifications were needed and the teachers' input was invaluable. In future program creation, I advise using both teachers' feedback and trialling the resource in classrooms.

The only downfall of the PIE framework was the reduced emphasis on the dissemination of the educational materials. Although some aspects of dissemination are highlighted in the implementation section (program operations), as dissemination is arguably one of the key elements when creating an environmental education program I believe it should have its own section. In the same way that an author who has published a book needs to promote it, through social media or book signings, to increase its popularity so does the author of an environmental education program. This can be done in several ways: through attending teacher conferences or disseminating the resource in a teachers' magazine or online. The APP resources were disseminated online, by the charity Cycle for Africa, which was chosen because the web allows global distribution. I suggest a new framework PIDE (planning-implementation- *dissemination*- evaluation) to be used to increase the emphasis on dissemination and encourage educators/ researchers to set aside a longer timeframe in which to distribute or advertise their program. The final stage in the PIE framework is evaluation (Jacobson *et al*., 2015). In this stage, the program must be evaluated to ensure the goals of the program are accomplished and see if there are any unanticipated results. Both qualitative (i.e. focus groups) and quantitative (i.e. before and after questionnaires) can be used in the evaluation of a program (Jacobson *et al*., 2015). In the case of the APP, a before and after the questionnaire was used containing both open and closed-ended questions to allow for qualitative and quantitative data collection. This is advised in the future as it allows for the advantage of both view expression and analysis. When using closed questions, it is recommended that multiple possible responses are provided (such as in the Likert scale) to improve the match between the answer given and the individual's viewpoint.

Overall the use of the framework PIE to create an environmental resource was very good, although because of the reduced emphasis on dissemination the use of the altered framework PIDE is recommended. Evaluation of environmental education programs are very neglected in the literature; of out of 56 tropical conservation education publications, evaluation was used in only 45.6% of them (Norris & Jacobson, 1998). Not only may the lack of evaluation mean that program goals are not being reached but there may also be some unanticipated results of the program. Therefore the future use of the PIE (or PIDE) framework in the creation of environmental

education resources will ensure that the evaluation of the materials is part of the creation process.

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The process behind developing a conservation education programme: *Changing Minds: Conserving the Javan palm civet*

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In Indonesia, the conservation education (CE) movement began in the 1960s in response to the critical condition of the country's biodiversity (Rudy, 2015). Despite collaborative efforts by the Indonesian government and NGOs to increase the outreach and impact of CE, implementation levels across the country remain low (Parker, 2016). This is due to educators not having access to the knowledge, training, and support required to develop CE programmes (Parker & Prabawa-Sear, 2019). To help address these issues I have developed a technical document for educators of the Little Fireface Project (LFP) outlining the development process of a CE programme based on the Javan palm civet. The programme titled "*Changing Minds: Conserving the Javan palm civet"* will take place over 9 weeks and is intended for children aged 8-12 that attend LFP's Nature Club (*Klub Alam*) (Table 1). I decided on the Javan palm civet as the target species as it is a relatively understudied species and despite being threatened by the pet trade, coffee industry, and retaliatory killings, has received limited conservation attention (Roberts, 2020).

To identify relevant educational theories, teaching methods, learning styles, and

instructional techniques for the programme I focused on UNESCO international education frameworks which have heavily shaped Indonesia's CE programmes and previous LFP CE programmes (Parker & Prabawa-Sear, 2019). I then used a purposive sampling method with google scholar, web of science, and academic books to identify Indonesian CE programmes that had successfully implemented the theories, methods, and techniques to provide additional relevance (Palinkas *et al.,* 2015). I consulted with LFP educators throughout the development process to ensure the programme's feasibility.

Learning will be structured around goals and objectives that have been developed using the competency-based approach to learning. Children will be required to master environmental knowledge, attitude, and skill competencies in order to achieve the programme's overall goal; to develop the long-term interest, commitment, and behaviours required to protect the Javan palm civet.

Table 1. The structure and conservation messages of the Changing Minds programme

Week	Activities	Message of story/activity
1	Welcome talk Pre-programme essay	Introducing children to the programme and assessing current knowledge and attitudes.
2	**Story 1: The civet who helped the coffee farmer** **Activities:** Colouring in + Seed growing activity Behavioural and emotional engagement scoring	Civets are important to coffee farmers; they disperse their seeds and help them produce civet coffee.
3	**Story 2**: **The civet who lost his mother** **Activities:** Colouring in + The smell trail activity Behavioural and emotional engagement scoring	Civets can communicate with one another through scent marking.
4	**Story 3**: **The civets from different homes** **Activities**: Colouring in + Guess the adaptation activity Behavioural and emotional engagement scoring	Civets have many adaptations which allow them to live in lots of different habitats.
5	**Story 4**: **The civet who made a friend** **Activities:** Colouring in + The do not disturb activity Behavioural and emotional engagement scoring	There are lots of misconceptions surrounding civets and how they behave around people. In fact, they are very shy animals.
6	**Story 5**: **The civet who was saved** **Activities**: Colouring in + Name your favourite things activity Behavioural and emotional engagement scoring	Civets do not do well in captivity. They belong in the wild.
7	**Story 6**: **The civet who had a dinner party** **Activities:** Colouring in + the civet detective activity. Behavioural and emotional engagement scoring	All civets are part of the Viverridae family. They are all omnivorous and carry out seed dispersal.
8	Spreading the word and Promise bracelet activity Behavioural and emotional engagement scoring	Ways the children can help protect civets by sharing what they have learnt with others.
9	Post programme essay story Certificate ceremony	Congratulating children for completing the programme and assessing changes in knowledge and attitudes.

I chose this approach due to its familiarity with students and educators through previous LFP CE programmes and Indonesia's current national curriculum (Nekaris *et al.,* 2018; Misbah *et al*., 2019).

Before developing the goals and objectives I determined whether the children's current perceptions of civets challenged, or supported my intended conservation messages. This is in line with the constructivist approach to learning (Larochelle *et al*., 1998). Through consulting with LFP educators I discovered that children's knowledge of civets is limited whilst perceptions are diverse. Civets are considered pest species, a commodity for the coffee industry, or a suitable pet. To counteract these negative perceptions I have focused on teaching children about the ecological importance of wild civets as natural seed dispersers and pest killers (Roberts, 2020).

Each of the six civet stories includes a conservation message that is reinforced using supplementary activities (Table 1). I used storytelling as a way to introduce scientific concepts in an engaging and culturally appropriate way. To increase the children's ecological knowledge and attitudes I have used non-extreme levels of anthropomorphism in the form of civet characters with names and emotions. By making the civet characters relatable I hope to instil feelings of empathy towards civets, which will lead to the children developing long-term interests and commitments towards protecting the species (McCabe & Nekaris, 2018).

I chose an activity-based learning approach ensuring the children are directly involved in their learning process whilst educators take on a supportive role, guiding children as they develop their critical thinking and creative skills through discovering, exploring, and problem-solving individually or with peers (Ramdiah *et al.,* 2018). The activities include case studies, games, hands-on activities, role-playing, and field trips. I included field trips as they have been shown to help learners develop conservation awareness and sensitivity by placing information taught in a classroom setting into real-world context (Lloyd *et al.,* 2018). For example, to reiterate the knowledge that civets are seed dispersers and producers of civet coffee the children will visit a local coffee plantation.

To evaluate whether the children have achieved the learning objectives (a summative evaluation) they will be asked to complete pre- and post-programme essays based on the question "what do you know about the Javan palm civet?" I chose essays as the evaluation method because literacy levels in Cipaganti village, where LFP is located, are 90%, making essay writing developmentally appropriate (Nekaris, 2016). I want to create an informal atmosphere where children do not feel like

they are being examined, therefore I avoided using test-style methods which are used in Indonesian formal education settings (Parker & Prabawa-Sear, 2019). Educators will use Bloom's six levels of cognitive learning and five levels of affective learning to evaluate knowledge and attitudes displayed in the essays. Educators will determine which level the children have achieved learning in by comparing the skills associated with each level to what the children have written (Nekaris *et al.,* 2018).

To evaluate how children respond to the learning environments (a formative evaluation) behavioural engagement observations and affective engagement tests will be conducted. These will evaluate engagement in terms of levels of focus and participation (behavioural engagement) and emotional reactions (affective engagement) towards activities (Lee, 2014). Creating an engaging learning environment is essential to avoid children becoming disengaged and unmotivated towards the learning content (Marks, 2000). Educators will observe and score each child's behavioural engagement level using a 1-5 scale from none to complete focus/participation; the more engaged they are the higher their score. Scoring will occur every 10 minutes throughout activities using a scan sampling approach (Altmann, 1974). To evaluate effective engagement the children will answer six statements after each activity that focus on positive and negative emotional responses, for example, "I felt happy during this activity" and "I felt bored during this activity". They will score their level of agreement on a 1-5 Likert scale, from strongly disagree to strongly agree.

By creating this technical document outlining the process behind developing the *Changing Minds* programme, I aim to assist educators of the LFP's Nature Club in successfully implementing and running the programme on a long-term basis. Ultimately this programme will bring greater awareness and support for the conservation of the Javan palm civet.

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Creative learning activities engage students in conservation education

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The goal of conservation education is to instil positive attitudes regarding the environment and conservation targets, increase knowledge about conservation challenges, and change human behaviour to promote positive environmental action (Wright *et al.,* 2017). While conservation education occurs in a variety of settings, from school classrooms to outdoor nature areas, conservation education that takes place in the setting in which they aim to conserve, offers the added benefit of first-hand experiences with nature. They also promote the educational benefits of natural resources (Jacobson & Padua, 1995).

Conservation education has been identified as a critical goal for lemur conservation in Madagascar, where 87% of the country's endemic primates are threatened with extinction (Estrada *et al*., 2017; Schwitzer *et al.,* 2014). While many organisations working in conservation in Madagascar aim to contribute to conservation education, most do not publish accounts of their efforts (Dolins *et al*., 2010; Wright *et al.,* 2017). The Lemur Conservation Foundation has been engaging in conservation education in Madagascar for several years but have yet to

conduct a formal evaluation on the impact of their work.

In this study, I aimed to assess student engagement with various activities occurring over the course of a forest-based conservation education programme, in Northeast Madagascar's Marojejy National Park. The forest-based education programme, run by the Lemur Conservation Foundation, aimed to instil ecological knowledge and create an emotional connection with the forest and the species living there, including the Critically Endangered silky sifaka (*Propithecus candidus*). Engagement was recorded using behavioural observations. These observations took place during the educational activities and utilised outward behaviour as a proxy for intellectual and emotional engagement.

This study took place in Northeast Madagascar. Students living in the city of Sambava were taken to Marojejy National Park on a three-day educational trip. Participants on each trip included 13-14 students and their teacher. Two experienced guides employed by Marojejy National Park and the Lemur Conservation Foundation led students in various lessons in rainforest ecology, animal behaviour, and conservation.

Students were encouraged to actively explore the forest, participate in creative endeavours and contribute to focused discussions throughout their three-day trip.

During each trip, I recorded behavioural observations of students' engagement with various activities, including: guide-driven explanations and forest walks; student-led exploration; animal and plant observations; kinaesthetic activities such as tree planting; and creative activities including drawing. During the observation periods, I scanned all visible students every 5 minutes and recorded their outwardly visible engagement with the task at hand. Classification of engagement scores are found in Table 1. Observations were made for every visible student and averaged for each observation period to create a group engagement score independent of other observations. Student's engagement with different activities was analysed via Kruskal-Wallis nonparametric analysis and pairwise post-hoc comparisons in SPSS Version 25.

There was a significant difference in the average amount of students' engagement observed during various forest activities (n=439 observations, Kruskal-Wallis H=15.097, df=4, p=0.005). Post-hoc analyses revealed a significantly higher level of student engagement in creative activities, when compared to guide driven lectures (p=0.011). There were no significant differences between the other groups, although students were more engaged in creative activities to a degree that approached significance (p=0.065).

Table 1. Behavioural engagement scoring system utilised to record students' engagement with activities in a forest-based education programme in Marojejy National Park, Northeast Madagascar

Engagement score	Description of engagement score
5	Very Attentive: The child focused on the lesson with body posture and gaze turned toward the teacher. The child is engrossed in the task.
4	Attentive: Child is attuned to the lesson He/she may look briefly towards other activities or classmates, but mostly engrossed in the task.
3	Somewhat Attentive: Child splits time between educational task, looking at the teacher and working on given task, and other activities such as talking to classmate or looking elsewhere.
2	Barely Attentive: Child may occasionally pay attention to the teacher but is most focused on other activities such as looking elsewhere, talking to fellow classmates or doing something not related to the lesson.
1	Not Attentive: Child does not pay attention to the teacher and is not interested in the lesson. The child may be looking elsewhere, talking to fellow classmates or doing something not related to the lesson.

This study found that student engagement differed during activities throughout the forest-based conservation education programme, suggesting that they preferred some activities (creative activities) over others (guide-drive talks/discussions).

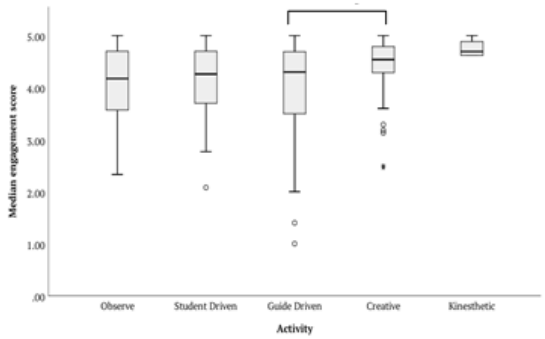

Figure 1. Median of group engagement scores (n=439) of students participating in various activities at a three-day educational forest camp in Marojejy National Park, Northeast Madagascar. (*) indicates significant difference.

This is consistent with Blumenfield *et al.* (2005) and Bonwell and Eisen (1991), who found that motivation to learn and student engagement with learning material is context dependent and students are more stimulated by some activities over others. This study provides useful information for future conservation education endeavours. These groups can emphasise creative lessons and activities as part of their programming in order to engage students with conservation ideas.

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Teachers perspective of conservation education in the UK National Curriculum

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Education is one of the most important aspects of conservation as the more people know, the more they can help (Jacobson *et al.*, 2015). Environmental education can be an effective way of getting people interested in the natural world and encouraging them to protect it. Introducing children to these topics from a young age is important as they are ultimately the ones who are going to inherit our planet. Environmental education can be delivered in schools to ensure that children understand their relationship with the environment. Unfortunately, environmental education is not often seen in schools and when it is, it is not done to its full potential in regards to addressing conservation. There are many reasons why this may be, including restraints from the curriculum. The most recent revision of the UK National Curriculum written in 2014 contains no explicit mention of environmental education, therefore meaning that it is not a compulsory topic. Despite this, there are many ways in which environmental education can be incorporated into the curriculum and there are resources available to assist teachers in doing so (National Curriculum Council, 1990; UNESCO, 1992; UK NAEE, 2018).

Due to the lack of environmental education being taught in schools, there is reason to believe that teachers are part of the problem (Yuan *et al*., 2017). It may not necessarily be their fault that children are missing out on these important topics, but there may be other reasons beyond their control as to why they are not including it in their teaching. As environmental education and conservation education are relatively new ideas, the current generation of teachers may have a

lack of awareness or understanding towards them. Another reason is that the curriculum or their school's structure restricts them from introducing environmental education. Teachers may be more than willing to include it in their sessions, but the demands of the curriculum and the aims of the school may simply not allow it. In addition to this, even if there is room for environmental education within their sessions, they may not have the resources or the skills to feel equipped enough to do so.

To find out how much conservation is included in schools and which factors might influence whether or not teachers include it, I designed a survey aimed at teachers to discover their opinions on conservation education. The survey asked questions about what teachers think of how conservation is addressed in their curriculum, and in their school. By doing this, I aimed to find out what the reasons are for conservation being missed out of children's learning in schools. One of the factors that I predicted would affect how much a school incorporates conservation education was if the school was located in a rural or urban area. Being immersed in nature can have a positive influence on attitudes towards it (Palmer *et al.,* 1998). Therefore, I predicted that rural schools would do more to address conservation than urban schools, As urban schools may not have had the experiences and therefore not acquired the knowledge that those at a rural school would have. One of the questions I included in the survey asked whether or not their school provides extra-curricular activities which address conservation. I predicted that more rural schools would provide extra-curricular activities than urban schools, due to the fact that they have the outdoor resources readily available to them. I also asked when children were introduced to conservation. I predicted that rural schools would introduce children to conservation sooner than urban schools because they are immersed in nature more which makes it more of a relevant topic.

To test the relationship between school location and provision of extracurricular activities which address conservation, a Chi-Square test for association was performed using SPSS. A second Chi-Square test for association between school location and when children are introduced to conservation topics was also performed. When running the second test, I grouped the key stages into 2 categories: Early Years Foundation Stage (EYFS) to Key Stage 2 (KS2) and Key Stage 3 (KS3) to Key Stage 5 (KS5), with a third category for answers of 'Don't know'. From the 38 responses I received, exactly 50% of them were from urban schools with the other half being rural, which meant I had a fair distribution of opinions from both types of school.

The Chi-Square test for an association between school location and whether or not they provide extracurricular activities showed that there is no statistically significant association (p=0.554), suggesting that a school being rural or urban, does not affect whether or not they provide extracurricular activities which address conservation. The results for this test are displayed in Figure 1.

Similarly, the second Chi-Square test for an association between school location and the key stage that children are introduced to conservation also gave an insignificant result of (p=0.336) (Fig. 2).

These results suggest that a school's location does not affect their provision of conservation education. This could either be a positive or a negative thing. It either means that urban schools ensure that their children do not miss out on the environmental opportunities that those children in rural schools have easy access to, or it means that rural schools do not take advantage of what they have on their doorstep and end up only providing as much environmental education as is possible in an urban location. The latter reflects previous studies where urban students show a stronger commitment to the environment as it is something that they are deprived of and perceive to be missing (Bogner & Wiseman, 1997). Rural pupils may not perceive it to be an important topic as it is readily available to them.

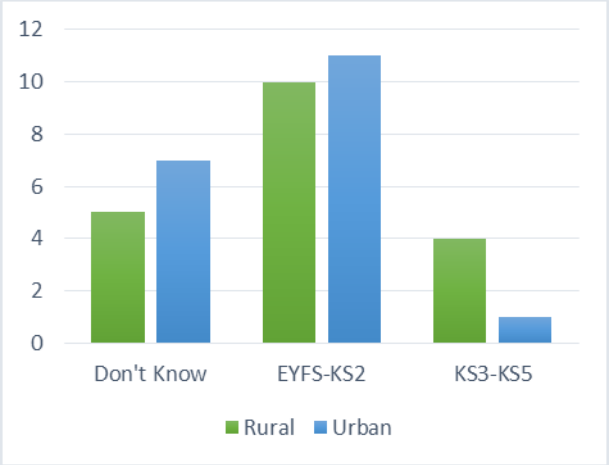

Figure 1. Association between school location and key stage introduced to conservation.

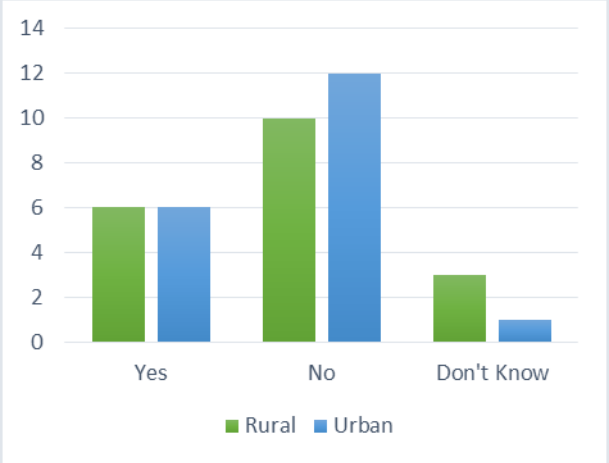

Figure 2. Association between school location and provision of extra-curricular activities.

For the question 'When are children currently introduced to conservation?' the answer with the highest number of respondents was 'Don't Know'. The rest of the respondents' answers were distributed between all of the key stages, excluding key stage 5. This suggests that there is huge uncertainty surrounding this topic which reflects previous studies regarding teachers' understanding of environmental education (Summers *et al.,*

2000). The range of answers could be because of many reasons. It could mean that children are being introduced to conservation at different ages depending on which school they attend and that there is not currently a specific time that they are first introduced to it. However, it could also mean that the teachers who responded to my survey interpret conservation differently to each other. There might be environmental topics introduced throughout the curriculum which some would define as conservation and others wouldn't, leading to ambiguity. There are many ideologies regarding environmental education which means it is often delivered in ways which achieve many different purposes (Stevenson, 2007) and this could lead to confusion as to how it is defined. Finally, the range of answers could simply because the teachers do not know and have tried to guess the answer. Whatever the reason, it is clear that there are no specific guidelines in place for when conservation should be introduced or any clear point in the curriculum at which it is explicitly mentioned. This means that teachers are under no obligation to include it in their lessons and that rather, as has been noted in other studies, it is a choice for whether or not teachers include it, and this comes down to their personal priority (Cutter & Smith, 2001). There should be guidelines in place to ensure that children do not miss out on learning about these important topics and further studies should be done to develop a better understanding of what factors lead to successful environmental education in schools.

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Optimising the educational impact of sanctuary visits at the Project Gorille Fernan-Vaz, Gabon

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The Project Gorille Fernan-Vaz (PGFV) is a Gabonese non-governmental organisation and has been a gorilla sanctuary since 2001 and rehabilitation centre since 2006 for western lowland gorillas who are victims of the bushmeat trade in Gabon. It is divided into two islands: Evengue-Ezango and Oriquet. Evengue Island is privately owned, with only the PGFV main camp and the gorilla sanctuary on it. The rest is covered by dense forest and savannah. Oriquet Island is entirely gorilla territory as the nine gorillas living on it roam freely through its dense forest and enjoy the surrounding lagoon. These gorillas are in the rehabilitation process for potential future release, so human presence is limited to five feedings a day and staff monitoring on motorless boats throughout the day. Today, there is a bonded group of nine gorillas living on Oriquet Island and four at the sanctuary. The PGFV acts for gorilla conservation in various ways, one of which is by organising guided, educative visits through the island's forest and sanctuary that start with a conservation lecture and various activities (Projet Gorille Fernan-Vaz, 2018).

The major themes of this study are ecotourism and in-situ conservation education. The main objectives of ecotourism are to avoid mass tourism and the unsustainable exploitation of natural resources, as well as to educate people about the importance of ecology by accessing remote places (De Haas, 2002). Wildlife sanctuary visits should and most often do contribute to a long-term goal of conservation of wildlife and its habitat (Ballantyne *et al*., 2007), because such experiences with wildlife can be memorable to the point of inciting positive eco-friendly behaviour change in people (Valentine & Birtles, 2004).

Conservation education is a branch of environmental education (Jacobson *et al*., 2006) that seeks to raise awareness and change the ways people think about the environment and the impact that their actions can have on conservation (Carleton-Hug & Hug, 2010). Bettinger *et al.* (2010) consider that for an educational program to be successful, it should increase knowledge, work toward people having more positive attitudes toward conservation efforts, and make people want to act for the good of conservation. As pedagogical studies show, if the student has a positive relationship with the instructor and the learning experience,

they are more likely to learn and be engaged (Roorda *et al.,* 2011). These studies are applicable to similar learning experiences such as conservation education. Thus, visitor satisfaction is important because they are more likely to learn if they have a positive experience during the visit. Learning styles also matter as not all people learn the same way and enjoy the same activities. Each individual has sensory preferences to how they learn and retain information (Jacobson *et al.,* 2006). There are three major types of learning styles currently recognised: visual, auditory, and kinesthetic. Visual learners generally prefer taking notes, need more concentration, and enjoy charts, graphs, photos, videos, and maps. Auditory learners prefer to listen rather than watch media, they are group-workers and choose to speak, discuss, listen, and read information out loud. Kinesthetic learners like to make, touch, create, and enact the information, they also take notes and are not bothered by distraction (Jacobson *et al*., 2006).

For this study, my main research question was: is the PGFV efficiently conveying important messages through its sanctuary visits? Among others, one of my objectives was to identify visitors' motivation for coming to the PGFV (Fig. 1) and preferences of both existing (Fig. 2) and potential activities (Fig. 3) to find ways in which satisfaction can be increased. I designed a questionnaire for sanctuary visitors and in total I witnessed five visits at the sanctuary from which I collected 16 questionnaires. Although the sample size is small, they were enough to better understand people's opinions, interests, and knowledge on the topics that matter to this study.

If we understand why people want to come, we can make sure they are satisfied after their visit and leave with an experience that is better than they expected. Figure 1 shows that almost all visitors came to see the gorillas and Figure 2 indicates that it is what the majority preferred. The issue of visitors not enjoying the educational forest walk and the conservation lecture enough but wanting a forest activity and a quiz on gorillas could be fixed by creating exciting activities about the local fauna and flora that involve kinesthetic and visual learning instead of having to simply listen to the guide. Also, the use of technology to show visuals about Oriquet and the island, or even the impact of logging, might be more effective than simply having a few sentences talked about during the conservation lecture.

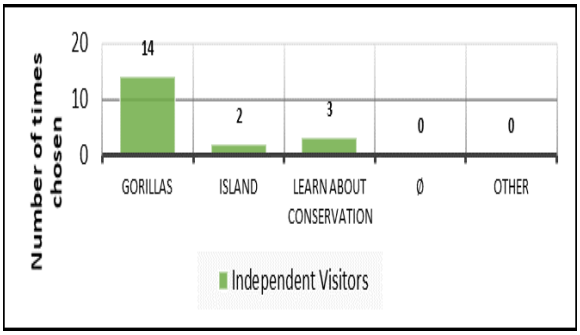

Figure 1. Independent visitors' motivations for coming to visit the PGFV, Gabon between May and July 2018, based on the number of times each answer was chosen.

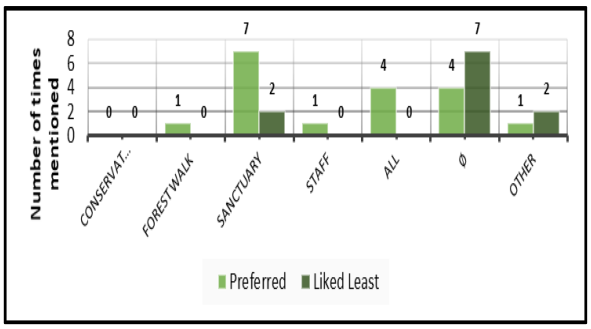

Figure 2. Independent visitors' activity preferences at the PGFV based on the number of times they were mentioned in the questionnaires, May – July, 2018, Gabon. Most people preferred the sanctuary part of the visit (N=7) and mentioned not liking anything the least (N=7).

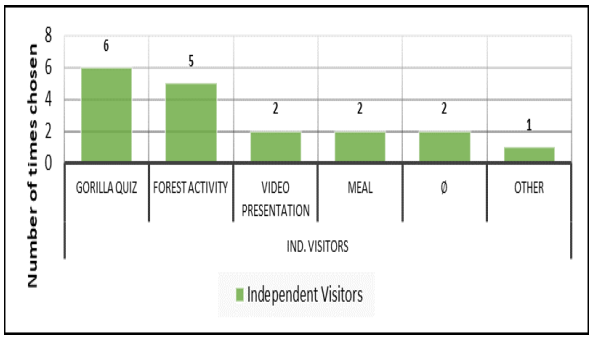

Figure 3. Additional activities suggested and number of times independent visitors chose them, May – July 2018, PGFV, Gabon. Most people said that they would enjoy a gorilla quiz and an interactive forest activity the most almost equally (N=6; N=5).

Interactive teaching could be implemented with small audiences (Bettinger *et al.,* 2010). Suggested activities to implement include:

- a plant and tree scavenger hunt in the forest path as a form of game, which motivates the participants to be engaged in doing the tasks and therefore learn (Korhonen & Lappalainen, 2004; Jacobson *et al.,* 2006). This would turn the forest walk into more of a kinesthetic learning activity;
- a conservation and identification quiz including photos of Gabonese wildlife, multiple choice definitions for terms such as 'conservation,' and guessing games for topics like identifying the species that are integrally protected by law in Gabon. This activity would involve visual learning;
- a short video presentation showing Oriquet and its rehabilitation gorillas, for the visual learners (Jacobson *et al.,* 2006; Bettinger *et al*., 2010).

In conclusion, although the results showed that visits do have a positive educational impact on visitors' knowledge, there are many additional ways to optimise it in the future. The only way to assess the success rate of the PGFV's conservation education program is by evaluating the methods used in the future. This preliminary study can be a helpful stepping stone.

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The primate and I: An environmental education program in urban, suburban and rural Dutch primary schools

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Primate education conservation projects are mainly being executed in primate habitat countries. I believe that there should be a greater emphasis on primate conservation education in non-primate ranges (i.e. western countries), as the majority of people living in these regions lack environmental knowledge.

Kuhlemeier *et al*. (1999) found that the majority of Dutch school children lack environmental knowledge, therefore the focus of my study was in Dutch primary schools. Research shows that environmental knowledge and attitude can be affected by several factors, like gender, age, education level and residency. The aim of my study was to assess whether there was a difference in primate and environmental knowledge and attitude of primary school children aged 10 to 12 years old between rural, suburban and urban areas in the Netherlands before and after an environmental education program about primates.

This study was conducted between 14 April and 31 August 2014. It involved two primate lessons, of 90 minutes each, at nine primary schools in seven municipalities of the province of Utrecht and one primary school in the municipality of Leidschendam-Voorburg in the province of Zuid-Holland in the Netherlands. The education program contained two primate lessons and covered topics on primate knowledge, human–primate relatedness and primate conservation. Data was gathered by using a pre-questionnaire directly before the start of the education program and a post-questionnaire directly after the education program was finished. The pre- and post-questionnaire were identical

and contained 24 questions on knowledge and attitude. A total of 258 pupils took part in both primate lessons. For the analyses only the data from 164 pupils were used, excluding participants who had not completed both a valid pre- and post-questionnaire.

The mean baseline knowledge score of the 164 participants from the primary schools included in this project was 35.4%. After the education program the knowledge of pupils group seven and eight increased. The results also show that there was a correlation between knowledge and residency. The urban pupils had a lower baseline knowledge about primates and the environment than pupils from rural and suburban areas. Remarkably after the education program results from the post-questionnaire show that pupils from urban primary schools had the highest increase of knowledge followed by pupils from rural areas. The pupils from suburban areas had the least increase of knowledge.

The attitude of the pupils towards primates and the environment was slightly positive before the education program and did not significantly change after the program. One explanation for this outcome is that it is difficult to change a person's attitude (Bettinger *et al.,* 2010). No correlation was found for attitude and residency.

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LORIS: Linking of Resources in Schools for Slow Loris Conservation. A conservation education programme on the illegal pet trade in the protected slow loris (*Nycticebus* ssp.) for Key Stage 3 (11-14 yrs.) students

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Asian slow lorises (*Nycticebus* spp.) are jeopardised by the anthropogenic threats of habitat loss, the unsustainable harvesting for the pet trade and for use in traditional medicines (Nekaris & Jeffe, 2007; Nekaris & Nijman, 2007). In response to the increasing trade and continuing habitat loss, the Convention on International Trade in Endangered Species (CITES) elevated the slow loris (*Nycticebus* spp.) from Appendix II to

Appendix I (Nekaris & Nijman, 2007). Capture for the illegal pet trade is one of the greatest threat to wild loris survival in Indonesia (Shepard *et al*., 2004). Lorises have become popular pets due to their soft, fluffy, toy-like appearance and are highly desirable as pets, not only in their habitat countries but also world-wide. The slow loris' popularity within the pet trade has accelerated sharply over the last few years and this international trade is partially fuelled by YouTube videos (Hance 2009). In 2011, International Animal Rescue launched a petition for the removal of any YouTube clip showing the endangered slow loris being kept illegally as pets. The rationale behind this call for censorship was the belief among experts that these seemingly harmless videos fuelled an already rampant pet trade in the species (International Animal Rescue, 2011; Sherwin, 2011).

Conservation education programmes can increase ecological awareness, foster more favourable attitudes towards the environment and promote natural resource conservation (Bexell, 2006). The main purpose of my study was to raise awareness in school children living in non-primate habitat areas, namely the United Kingdom, to the plight of the threatened slow loris (*Nycticebus* spp.) and investigate the effectiveness of an educational programme on the attitudes of British school children. An underlying aim of the workshop was to promote a desire among the children to understand these primates and help mitigate the threats facing them. This was achieved through a range of interactive activities, promoting the development of critical thinking, decision making, deductive reasoning and analytical skills implemented in three schools.

There was a high level of interest and concern for the conservation of the slow loris amongst the students. The workshop significantly improved the students' attitudes towards conservation, slow loris knowledge and highlighted the negative impact the 'cute' videos of loris on YouTube play in fuelling the illegal pet trade. These findings also show that a workshop can affect significant attitude changes (Bogner, 1998). The results also show the benefits of providing a variety of teaching materials to ensure that different preferences and intelligences are catered for (Gardner, 2006). All three schools showed significant shift in the number of students expressing pro-conservation attitudes towards watching the 'funny' slow loris videos on YouTube at the end of the workshop in comparison to those negative conservation attitudes expressed prior to the workshop, St. Marys ($Z=-2.889$, $P=0.004$), Sir Harry ($Z=-3.729$, $P=0.000$) and Cherwell ($Z=-2.964$, $P=0.003$).

The project was well-received by students and teachers. Overall the results and feedback for the programme from both the students and the teachers was positive. There was a sense

of enthusiasm, excitement and anticipation by the students and they seemed to actively engage in the activities. While the empirical data may not fully indicate that the students gained a lot from this programme due to the sample size, the atmosphere and participation of the students in the programme was, for me, the most rewarding part of the project. The evidence suggests that education could be a valuable tool for species conservation. The message of the workshop was readily absorbed by the children, possibly due to the content in a time when there is increased media and legislative focus on the issues surrounding the illegal pet trade (Sherwin, 2011; BBC 2, 2012; Nekaris, 2012) or due to the emotional aspect of the piece.

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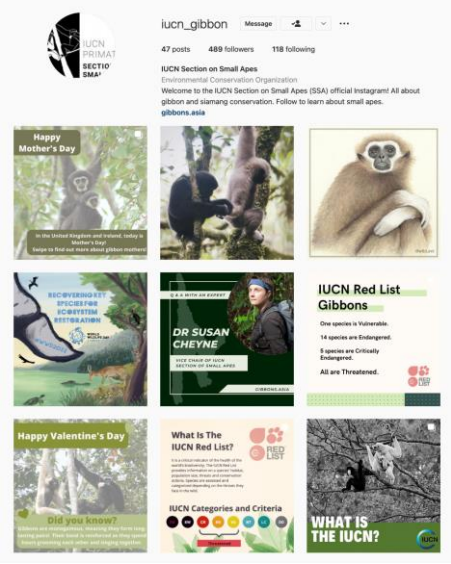
Conservation and Art in the 2021-22 academic year

World Wildlife Day art and movie night

The UN World Wildlife Day is celebrated annually on the 3rd of March. This year's theme was all about recovering key species for ecosystem restoration, which deeply connects to what our students, researchers and professionals are doing in the Oxford Brookes University Primate Conservation Group. Primates are an important example of a key species, as seed dispersers and environmental 'engineers'. To celebrate this year's World Wildlife Day, the Primate Conservation MSc students engaged in art to fundraise for wildlife conservation research and to raise awareness. The event was all about art and its contribution to conservation. Student art of wildlife and especially primates was printed on organic tote bags and sustainable paper for the fundraising on campus, and the day was ended with a movie screening night. We screened five original short movies that won the Conservation Optimism Film Festival: Good Natured 2021, followed by David Attenbourough: A Life on Our Planet.

IUCN Section Small Apes social media

As we discuss the role of education in conservation, social media is an extremely important tool with the power to reach people from all corners of the world and engage them in conservation and spread information and awareness on endangered species. For International Gibbon Day (IGD) on 23rd October, 2021, The IUCN Section on Small Apes officially launched its Instagram page, led by Dr Susan Cheyne and a group of students from our Primate Conservation MSc programme. The IGD campaign on Instagram was a success and reached out to thousands of people from all over the world,



especially from Asia. With photographs of gibbons, original activity pack, student infographic designs and drawings we used another form of art to raise awareness on social media and share information about gibbons, the IUCN Red List and its categories and more. The Instagram account has reached almost 500 followers and will continue to grow and be passed on to future cohorts, to bring awareness to gibbon conservation and help support the work of the IUCN Section on Small Apes.

The Role of Art in Conservation: An interview with Professor Anna Nekaris, founder of the Little Fireface Project

With over 20 years of experience in conservation, we interviewed professor Anna Nekaris, the leader of the conservation education module in our programme, who recently celebrated 10 years of running the Little Fireface Project. The Little Fireface project puts a strong emphasis on education and we asked Professor Nekaris about the role of art in conservation.

Do you think art can make a change in conservation?

"Art is one of the most important media for conservation, be it people responding to an animal's plight through art, learning to love animals through storybook art, supporting conservation efforts through wearable art, or connecting to nature through film and music. Many children first learn about animals through drawing them, and some of the earliest images of art in the world are of animals, showing our long contact with nature. Indeed, for most people art can deliver a more immediate impact than the science that may be behind it. People might remember an image, a song, a poem - something that happens less often when reading a scientific paper. Art may represent the situation of an ecosystem or an animal itself".

Could art be effective in communicating conservation issues and speak to people's emotions?

"I personally feel that art is vital for conservation. Art can also bring people from totally different disciplines together and unite them for a cause. Biologists sometimes do not know how to speak to the public, whereas a passionate artist often can relate in very different ways to get across an issue. It can also bring situations that are sad and difficult to look at into a different perspective. For example, I once was handed a glass jar full of plastic, and the colours actually looked quite beautiful and the selection of objects rather odd and amusing...then we learned it was the stomach contents of a migrating sea bird that had died. This was so impactful, that many people in the room who were heads of zoos signed up to a no plastic commitment for their zoo; others like me never bought a lighter ever again (somehow this being the most shocking and least biodegradable element in the poor bird's stomach)".

Could you give us an example from your project, of how art can change perceptions of animals?

"In Indonesia, we taught a delightful storybook about the slow loris. We made sure the lorises showed their anthropomorphic toothy smile but at the same time their chisel like teeth were shown gouging for gum and injecting venom! Since teeth cutting is a major threat to slow lorises in pet trade, we hoped that the mental image of children after our programme would be a slow loris with its teeth. And this was the case! Interestingly even more boys drew lorises with teeth. As the potential wildlife traders of the future, we would hope they would think twice before cutting a lorises teeth".

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