

Exploring Students' Academic Emotions Through a Conservation Education Program

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Abstract: Research and practice in educational settings should consider exploring the rich diversity of emotions experienced by students outside classroom settings, including nature clubs, as a conservation education program. This study aimed to conduct an exploratory case study to explore students' academic emotions during conservation education programs. The case study was carried out for four weeks to determine what can be learned from a single case about the students' emotional aspects of the conservation education program in the Nature Club. Data collection is conducted through observation, interview, and collection of documents at the end of every activity. The data consisted of field notes and videotapes from observation, interview transcripts, and student emotions diary (SED). The research participant was 21 elementary students aged 9 to 11 who joined the Nature Club conducted by the Little Fire Pace (LFP) Community as one of their conservation education programs. The result shows that conservation content which is also part of science, can be learned and stimulate the emergence of students' academic emotions, both positive and negative. The dominant emotion in nature club activities is the happy emotion, and the slightest emotion arising from this activity is disgust. Then the results of student interest in all activities were more remarkable than boredom. Finally, suggestions are made on implications for teacher or pre-service teacher education for conservation or science education.

Keywords: Academic emotion; Nature club; Conservation education; Science education.

Introduction

Indonesia is a mega biodiversity country that comprises two of the world's biodiversity hotspots that bring significant and strategic benefits for national development. However, Indonesia's high biodiversity is highly threatened by habitat loss and must be balanced with its preservation and utilization to achieve a sustainable ecosystem (Von Rintelen et al., 2017). Building a society that cares and takes responsibility for creating a sustainable environment is necessary. Environmental education should be one component of a multifaceted campaign to increase public awareness of the environment (Parker, 2018). A conservation program is one form of environmental education known ages ago and the government should include education on the conservation in schools and general college curricula as

an essential component of biology learning (Gavin, 1959).

For most students, learning that nature is alive and linked together, for instance, would be a revelation. Practically every subject covered in our schools' and colleges' general curriculum would have additional relevance if students were to understand conservation principles (Parker & Prabawa-Sear, 2019). The curriculum integrates nature conservation material into biology subjects, making it appear insignificant to students (Soenarno & Miranti, 2021). There is a need for a transformative program for students to achieve conservation education goals. One of them is a nature club organized by the Little Fire Pace (LFP).

LFP started in 1994 under the supervision of Oxford Brookes University's Nocturnal Primate Research Group and became an independent project in 2011. LFP's

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current main field project is on the Indonesian Java island to study the Javan slow Loris ecology and contribute wherever possible to the conservation (Nekaris, 2016). Meanwhile, Nature Club is a conservation education program running by LFP since 2013 for local elementary students. Nature Club provides students with a sense of joy and wonder regarding nature and wildlife, helping them learn more about their local ecology, and providing hands-on learning experiences within their environment, ultimately leading to positive behavior change (Nekaris et al., 2018). Ecology and wildlife, the primary subjects of Nature Club, are studied and conducted with a full range of emotions found in every human activity. However, limited classroom research is available to inform teachers about the range of students' emotional experiences or how they should react to their students' emotional arousal (King et al., 2015).

The previous set of research explored students' emotional expressions to identify positive classroom transactions in science classes, such as the importance of emotional labor in science teaching (Zembylas, 2004); emotions, feelings, and moods in science classroom interactions (Teixeira dos Santos & Mortimer, 2003); and the emotion of joy related to the learning process (Laukenmann et al., 2003). Such a set of research is new and emerging. However, there is a need to look at students' distinct emotions during particular science activities, including conservation education programs. The empirical evidence from past studies confirms that academic settings abound with various emotions. Research and practice in educational settings should consider exploring the rich diversity of emotions experienced by students outside classroom settings, including nature clubs, as a conservation education program.

Initially, one broad question that guided our study was how conservation education programs evoke academic emotions in students. As the research evolved to reveal further information, two more focused questions emerged which are what were the primary emotions and variations of emotions experienced by the students and what were the characteristics of the activities that contributed to students' academic emotions.

Method

Research Design

This study aimed to conduct an exploratory case study (Yin, 2009) to explore students' academic emotions during conservation education programs. The case study was carried out for four weeks to determine what can be learned from a single case about the students'

emotional aspects of the conservation education program in the Nature Club or outside classroom setting. The intention is not to generalize on the emotional aspects of this education program but to identify those issues that need further exploration. The Researcher designed seven activities throughout four-week conservation education programs in the Nature Club setting.

Participants

The research participant was 21 elementary students aged 9 to 11 who joined the Nature Club conducted by the Little Fire Pace (LFP) Community as one of their conservation education programs. All participants are local students living near Javan Slow Lorises' habitat, so conducting an education conservation program is feasible. The age of the students is also one thing to consider when choosing participants. It is generally recognized that students over nine can openly or visibly convey their feelings. In addition, the student can also understand the instructions for participating in activities in the nature club.

Instruments

Research instruments for data collection are developed to answer a research question. Data collection is conducted through observation, interview, and collection of documents at the end of every activity. The data consisted of field notes and videotapes from observation, interview transcripts, and student emotions diary (SED). Since spontaneous speech, facial expressions, and body language are crucial for communicating emotions; observation was used to capture all of those. The observer did observation by making specific field notes, also recorded by video.

After each activity, students are given a sheet for the emotion diary, adapted from Zembylas' (2002) diary, to record their feelings experienced throughout the activities. The researcher provided ten emotions emoticons on the SED (happiness, sadness, anger, fear, disgust, pride, wonder, enthusiasm, frustration, and embarrassment) to make it easier for students to convey their emotions. Students were also asked to identify the activity circumstances that evoked the arousal of this emotion through instructions in SED, such as: what they were doing, what happened when they experienced the emotion, and at what or whom the emotion was directed. The researcher also included the interest rating as a scale at the bottom of the SED to identify the activity in which students may have expressed intense emotions. Before starting the activities in Nature Club, students were given a briefing to assist them in identifying their emotions and understanding instructions on SED. Furthermore, interviews were conducted after each

activity, which contributed to amplifying the evidence in SED and field notes.

Data Analysis

The data analytical techniques are separated into meso level and micro level. The meso-level analysis uses data from observation, interviews, and student emotion diaries. Meanwhile, the micro-level analysis uses data from facial expressions and emotive words. Students' emotion diaries were analyzed for evidence of the discrete emotions connected to students' activities. We analyzed data on SED through frequency analysis to determine which activities evoked strong emotion and otherwise. When the emotion was identified through the diaries, we replayed the video recordings and analyzed field notes to find the relevant micro-level evidence that verified students expressed intense emotions. We used Ekman and Friesen's Facial Action Coding System (FACS) (Ekman, 2004) to verify students' facial expressions. Meanwhile, to verify body movements and gestures, we used Harrigan framework (2008) . When the researchers were convinced through the triangulation of data of the students' emotions, we interviewed three students who expressed strong or extraordinary emotions for deeper explanation and interpretation.

Context: Little Fire Project Community and Conservation Education Program

Little Fire Project (LFP) is a Slow Lorises conservation community in Cipaganti Village, Cisarupan District, Garut City. One of LFPs' conservation education programs is Nature Club, which has been running since 2013. The Nature Club focuses on conservation education about Slow Lorises, other wildlife animals and the protection of their habitats. Apart from being a place for conservation, and educational programs, LFP provide activities in which they can collaborate to conduct research. Researchers collaborate and conduct research with the help of experts from LFP. The expert helps validate and gives feedback on activities that stimulate or evoke student emotion. The expert also helps as an observer and verification for a micro-analysis technique of emotions during data triangulation. After this research activity was carried out, Nature Club continued its education conservation program with a wider range.

Result and Discussion

Researchers have explored students' academic emotions during conservation education activities at LFP's nature club. Activities at the nature club were carried out seven times in four weeks. The activities carried out require diverse activities to stimulate

students' academic emotions. In more detail, student activities while in the nature club can be seen in Table 1.

Table 1: Activities in Nature Club LFP

Activities	Description	Week
0	Briefing	1
1	Introduction of Wildlife Animal	1
2	Story Telling	2
3	Wildlife Arts and Craft	2
4	Wildlife Campaign	3
5	Direct Habitat Observation	3
6	Fun Games	4
7	Reflection	4

The first finding of the research refers to the student's academic emotions explored during all activities through students' emotions diary, shown in Figure 1. Overall, students express eight different academic emotions throughout all activities. Out of the eight emotions explored, dominated by happiness and followed by pride. Meanwhile, the slightest emotion shown is disgust. Interestingly, sadness, fear and anger, well-known as negative emotions, emerged between the top and bottom of emotions frequency. This finding indicated that students undergo various academic emotions while performing activities in Nature Club.

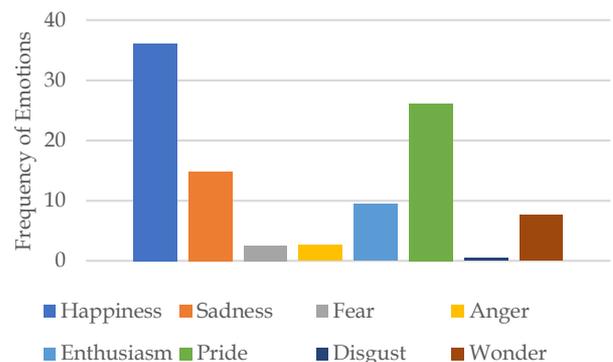


Figure 1. Variation of Emotion Expressed during Nature Club Activities through Students' Emotions Diary

This result shows that conservation content which is also part of science, can be learned and stimulate the emergence of students' academic emotions, both positive and negative. In addition to data on emotions from students' emotion diaries, to verify students' emotions, there are field notes and video recordings used to verify these emotions from various emotional artifacts such as facial expressions, behaviors performed, and verbal expressions. For example, happy emotion artifacts that students generally display include showing a smile on their faces, laughing, and clapping their hands.

Emotion is a phenomenon that involves the coordination of several aspects of psychological

processes, including affective, cognitive, physiological, motivational, and expressive components (Scherer, 2009). To identify some of these aspects, researchers also conducted interviews mainly to explore precisely when the emotion appeared, under what conditions and at what the emotion was addressed.

As for happy emotions, students said they feel comfortable and feel a friendly classroom atmosphere. Then cognitively, students feel enthusiastic about what they do. Physiologically, seen from students' expressiveness, they display cheerful faces, applause and verbally expressive say, "Hurray, Yes, It is fun". Other studies support this finding that happiness is expressed through aggression, such as a clenched jaw, a show of teeth, waving of fists, and loud vocalizations (Aragón & Bargh, 2018).



Figure 2. One of Students' Expression during Nature Club Activities

In this study, the most identified emotion after happiness was pride. Both are classified as positive emotions. Pride is a result of a mixture of aversion-fear and satisfaction-happiness. Pride is one of the academic emotions involving self-evaluation concerning academic success (Turner, 2007). The attribute of pride in an educational setting is associated with achievement, success, and task orientation. Research findings show that in task-oriented activities, students feel pride when they finish their tasks, such as making wildlife crafts and winning at games by answering questions. This finding was identified in SED and verified through interviews.

The observed emotional artefacts for pride have similarities with happy emotions. Students who, in the initial interview, stated that they were proud to finish the task were seen with broad smiles. We asked further questions to verify the cause of the students' smiles, and they answered because they could answer quiz questions and paint well. This result aligns with previous research, stating that challenging science activities were associated with justified pride (Bellocchi & Ritchie, 2015). This result shows that happiness and

pride were close to each other as both are positive emotions and have similarities in artifacts. This is in line with other study that basic emotions share some common psychological or artifacts components (Wang et al., 2019).

Meanwhile, one negative emotion emerges after those two positive emotions, following close to the two emotions: sadness. The observed emotional artefacts for sadness are expressions of unhappiness such as downturned mouths, frowning eyebrows, bowed heads. In the Nature Club activity, students show those sad expressions when listening to stories about endangered wild animals. This sad emotion is a response that arises when students are faced with a situation that is not following expectations. But, in this study,

After the three dominant emotions described, two other interrelated positive emotions emerged even though the frequency was half the previous dominant emotions: wonder and enthusiasm. Students experienced wonder when they were introduced to wild animals during nature club activities and astonishment about wildlife nature, which was close to them. This wonder emotion leads students to express their enthusiasm for learning about wildlife and how to care for them in conservation. That is why these two emotions are interrelated and appear in frequencies close to each other.

A greater feeling of satisfaction-happiness combined with fewer feelings of aversion-fear could describe the emotion of wonder (Turner, 2007). The observed emotional artifacts for wonder, for example, jaw dropped, placed a hand over the mouth while screaming 'Ooh.' In the interview, students said they were surprised that kukang is one of the world's top three most endangered animals. They also wonder why Indonesia has so many protected wildlife animals.

Finally, three negative emotions show a frequency of at least below five percent, namely fear, anger, and disgust. This result happened because Nature Club activities initially expected to stimulate the three negative emotions did not have an effect. For example, students do not feel disgusted, fearful, or angry in outing activities to the garden by passing through muddy roads and animal waste. Students are local people who live near the habitat of these wild animals, and students are accustomed to the environment there, so these three negative emotions are not dominant and appear the least. Moreover, students' sad emotional states due to facing situations that did not match ideal conditions, such as a story about endangered animals and human activities that endangered wildlife, did not lead to other negative emotions such as anger, fear, and disgust.

This overall result initiated that such a wide range of activities in the Nature club contributed to students' emerged positive and negative emotions. Those

emotions are associated with students' interest and engagement in learning about wildlife at Nature Club as a conservation program. Interests are less likely to be primary emotions and more associated with students' cognitive states (Turner, 2007). Recent studies have revealed that to keep students interested in learning, the type of activity is more crucial than the subject matter (Swarat et al., 2012). This study has seven different activities to stimulate student emotions and keep students interested and engaged. Figure 2 shows student interest frequency during all activities in Nature Club. Students' frequency interest data come from the scale at the bottom of the SED, which is the interest rating to identify the activity in which students may have expressed intense emotions.

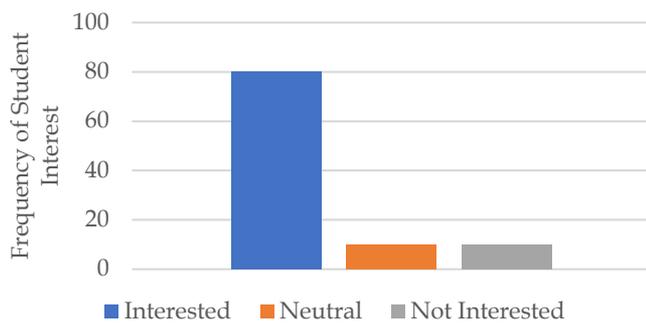


Figure 3. Frequency of Student Interest during Nature Club Activities

Figure 3 shows that students' interest in activities is more remarkable than boredom. Existing records on the SED and interviews also support this data. Students mentioned always being interested when doing activities in Nature Club, especially when drawing, watching, doing outdoor activities, playing educational games, and doing what the students did not feel like doing crossword puzzles. This evidence is reinforced by field notes that record that most students show smiles and laughter, enthusiasm by competing to answer quizzes, and enthusiasm to do each challenge given. Verbal phrases that show interest, like "this is exciting" and "this is fun," are expressed by students. Students especially recorded the word relay game activity as the most interesting in the emotion diaries.

Undeniably, some students feel bored; students generally feel bored in activities that involve writing and filling in Crossword Puzzles. Undeniably, some students feel bored; students generally feel bored in activities that involve writing and filling in Crossword Puzzles. Field notes reinforce this fact. Students bored with activities in the nature club choose to do other activities such as banging on papers, throwing papers at their friends, daydreaming, not focusing, looking upset,

chatting with others, and always wanting to go home quickly.

Out of seven activities in Nature Club, we were heightened activities where students expressed high-intensity emotion. Table 2 shows students' high-intensity emotions during each activity.

Table 2: Students' high-intensity emotions

Activities	High-intensity emotions showed	Number of different emotions showed
1	Happy, Pride, and Wonder	7
2	Happy, Pride, and Wonder	4
3	Happy, Pride, and Sad	3
4	Happy, Pride, and Sad	3
5	Happy, Sad, and Pride	6
6	Happy, Enthusiasm, and Sad	7
7	Happy, Enthusiasm, and Sad	7

Activity that stimulates the emergence of various emotions is the introduction of wildlife animals, fun games, and reflection. Each of these activities evoked seven different emotions. Students find these activities exciting and fun. This result is in line with another study that shows student emotions are deeply associated with student interest while learning something (Prado et al., 2022). Meanwhile, activities that stimulate the least emotions are making crafts and doing campaigns. Students are not familiar with these activities and find these activities challenging. Students show high-intensity negative emotions while doing these two activities, which is sad. Although in the end, there is an emotion of pride when students can complete the challenging task. This data aligns with other research results that conclude negative emotion can influence self-efficacy, interest, cognitive as well as motivational and affective processes in learning (Holstermann et al., 2009).

This research has shown that the choice of activity is essential for stimulating an intense variety of positive and negative emotions. The study shows that the type of activity and the way the activity was conducted contributed to students' emotional arousal. According to another study, selecting activities that made students feel strongly positive emotions helped them concentrate on the concept they were learning and helped them remember the activities favorably (King et al., 2015). These beneficial encounters might also boost students' long-term memorability and interest in science. A limitation of this study is that it focused on one community case-study student in one area. More participants in quantitative research may allow for opportunities for generalization and offer more information on the relationship between the nature of the activity and students' emotional responses.

The link between emotions and students' long-term memory or cognitive competencies has not been investigated extensively in conservation or science education (Barab et al., 2007). A further study can explore a bit more about this connection. Further study research is needed to examine if these intense emotional activities can make students able to recall the associated conservation or science knowledge accurately. Finally, suggestions are made on implications for teacher or pre-service teacher education for conservation or science education.

Conclusion

The current study has shown that various activities to conduct conservation programs enable emerge a variety of students' emotions. This result shows that conservation content which is also part of science, can be learned and stimulate the emergence of students' academic emotions, both positive and negative. The dominant emotion in nature club activities is the happy emotion, and the slightest emotion arising from this activity is disgust. Then the results of student interest in all activities were more remarkable than boredom. This research result can be a suggestion for teacher or school to involve activities that can stimulate students' emotions to have a good impact on the quality of learning.

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Author Contributions

Conceptualization, L.M. and R.M.; methodology, L.M.; validation, A.R., L.M. and R.M.; formal analysis, A.R.; data collection, W.F.; resources, W.F.; data curation, W.F.; writing—original draft preparation, R.M.; writing—review and editing, R.M.; supervision, L.M. and A.R.; project administration, W.F. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare no competing interests.

References

Aragón, O. R., & Bargh, J. A. (2018). "So Happy I Could Shout!" and "So Happy I Could Cry!" Dimorphous expressions represent and communicate motivational aspects of positive emotions.

- Cognition and Emotion*, 32(2), 286–302. <https://doi.org/10.1080/02699931.2017.1301388>
- Barab, S., Zuiker, S., Warren, S., Hickey, D. A. N., Ingram-goble, A., Kwon, E., Kouper, I., & Herring, S. C. (2007). Understanding Engagement: Science Demonstrations and Emotional Energy. *Science Education*, 91, 750–782. <https://doi.org/10.1002/sce>
- Bellocchi, A., & Ritchie, S. M. (2015). "I Was Proud of Myself That I Didn't Give Up and I Did It": Experiences of Pride and Triumph in Learning Science. *Science Education*, 99(4), 638–668. <https://doi.org/10.1002/sce.21159>
- Ekman, P. (2004). Emotions revealed. In *Bmj* (Vol. 328, Issue Suppl S5). <https://doi.org/10.1136/sbmj.0405184>
- Gavin, A. (1959). The Urgency of Conservation. *Blue Jay*, 17(4), 72–75. <https://doi.org/10.29173/bluejay2173>
- Holstermann, N., Grube, D., & Bögeholz, S. (2009). The influence of emotion on students' performance in dissection exercises. *Journal of Biological Education*, 43(4), 164–168. <https://doi.org/10.1080/00219266.2009.9656177>
- Jinni A. Harrigan, Robert Rosenthal, and K. R. S. (2008). *The new handbook of methods in nonverbal behavior research*.
- King, D., Ritchie, S., Sandhu, M., & Henderson, S. (2015). Emotionally Intense Science Activities. *International Journal of Science Education*, 37(12), 1886–1914. <https://doi.org/10.1080/09500693.2015.1055850>
- Laukenmann, M., Bleicher, M., Fu, S., Gläser-Zikuda, M., Mayring, P., & von Rhöneck, C. (2003). An investigation of the influence of emotional factors on learning in physics instruction. *International Journal of Science Education*, 25(4), 489–507. <https://doi.org/10.1080/09500690210163233>
- Nekaris, K. A. I. (2016). *The Little Fireface Project: Community Conservation of Asia's Slow Lorises via Ecology, Education, and Empowerment*. July 2016, 259–272. https://doi.org/10.1007/978-3-319-30469-4_14
- Nekaris, K. A. I., McCabe, S., Spaan, D., Ali, M. I., & Nijman, V. (2018). A novel application of cultural consensus models to evaluate conservation education programs. *Conservation Biology*, 32(2), 466–476. <https://doi.org/10.1111/cobi.13023>
- Parker, L. (2018). Environmentalism and education for sustainability in Indonesia. *Indonesia and the Malay World*, 46(136), 235–240. <https://doi.org/10.1080/13639811.2018.1519994>
- Parker, L., & Prabawa-Sear, K. (2019). Environmental education in Indonesia: Creating responsible citizens in the global South? In *Environmental*

- Education in Indonesia: Creating Responsible Citizens in the Global South?* (Issue August). <https://doi.org/10.4324/9780429397981>
- Pekrun, R. (2011). New Perspectives on Affect and Learning Technologies. *New Perspectives on Affect and Learning Technologies*. <https://doi.org/10.1007/978-1-4419-9625-1>
- Pekrun, R., & Stephens, E. J. (2011). Academic emotions. *APA Educational Psychology Handbook, Vol 2: Individual Differences and Cultural and Contextual Factors.*, 2, 3–31. <https://doi.org/10.1037/13274-001>
- Prado, B. G., Puig, B., & Evagorou, M. (2022). Primary pre-service teachers' emotions and interest towards insects: an explorative case study. *Journal of Biological Education*, 56(1), 61–76. <https://doi.org/10.1080/00219266.2020.1756896>
- Scherer, K. R. (2009). The dynamic architecture of emotion: Evidence for the component process model. *Cognition & Emotion*, 23(7), 1307–1351. <https://doi.org/10.1080/02699930902928969>
- Soenarno, S. M., & Miranti, A. (2021). Conservation Education for Elementary School Students. *Edukasi*, 15(1), 74–82. <https://doi.org/10.15294/edukasi.v15i1.30196>
- Swarat, S., Ortony, A., & Revelle, W. (2012). Activity matters: Understanding student interest in school science. *Journal of Research in Science Teaching*, 49(4), 515–537. <https://doi.org/10.1002/tea.21010>
- Teixeira dos Santos, F. M., & Mortimer, E. F. (2003). How emotions shape the relationship between a chemistry teacher and her high school students. *International Journal of Science Education*, 25(9), 1095–1110. <https://doi.org/10.1080/0950069032000052216>
- Turner, J. (2007). Human Emotions. *Angewandte Chemie International Edition*, 6(11), 951–952., 2013–2015.
- Von Rintelen, K., Arida, E., & Häuser, C. (2017). A review of biodiversity-related issues and challenges in megadiverse Indonesia and other Southeast Asian countries. *Research Ideas and Outcomes*, 3. <https://doi.org/10.3897/rio.3.e20860>
- Wang, Y., Zhu, Z., Chen, B., & Fang, F. (2019). Perceptual learning and recognition confusion reveal the underlying relationships among the six basic emotions. *Cognition and Emotion*, 33(4), 754–767. <https://doi.org/10.1080/02699931.2018.1491831>
- Yin, R. K. (2009). Case study research: design and methods, Applied Social Research Methods Series. *SAGE Publications*, 5, 365.
- Zembylas, M. (2002). Constructing genealogies of teachers' emotions in science teaching. *Journal of Research in Science Teaching*, 39(1), 79–103. <https://doi.org/10.1002/tea.10010>
- Zembylas, M. (2004). Emotion metaphors and emotional labor in science teaching. *Science Education*, 88(3), 301–324. <https://doi.org/10.1002/sce.10116>