

A PILOT STUDY OF BIODIVERSITY CONSERVATION EDUCATION FOR STEM: ATTITUDES PROMOTED AMONG JAPANESE FEMALE STUDENTS

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THEME:

STEM Education and Sustainability

AIMS AND PROCESS

A cross-curricular STEM approach is essential for the development of educational programs leading to a sustainable global environment. Educational measures to spread the concept of biodiversity conservation among people, closely related to the issue of environmental sustainability are urgently needed (UNESCO, 2021; MEXT, 2022).

The author has developed a program for university female students to explore biodiversity issues in terms of wildlife. The students worked on endangered species information cards [ESIC] in 2021. This research focused on students' descriptions of "what I can do to solve the endangered species problem," which they wrote after creating the ESIC. The descriptions made by 75 female university students were analyzed by a text mining method.

RESULTS AND CONCLUSIONS

Nine co-occurrence networks were found in the description of terms. Among the nine networks, the most occurring terms (11 terms) had "suspicious, good, think, accidentally, intend, products, purchase, commodities, certification, forest, keep in mind" (network 1). The next common network included seven terms: "bring in, alien species, nature, pets, keep, creatures, extinction" (network 2), and "correct, current situation, global warming, reduction, garbage, paper, plastic" (network 3). There were three co-occurrence networks that included five terms in each: "many, think, animals, endangered species, know" (network 4), "poaching, making, preventing, creatures, good" (network 5), and "donations, groups, protection, activities, participation" (network 6). Four terms were included in network 7, "littering, garbage, forest, take home."

The following intentions and interests are considered as students' actions for biodiversity conservation. The actions of purchasing of goods (network 1), taking in alien species and breeding pets (network 2), and reducing waste, paper, and plastic used to solve global warming (network 3). Moreover, students realized the importance of knowing the endangered status of species and preventing poaching (networks 4 and 5). Furthermore, students found that actions such as donating and participating in activities (network 6), and not littering and collecting trash collection (network 7) could contribute to conserving biodiversity.

The methodology developed in this study can promote awareness of biodiversity conservation among people by articulating how to incorporate it into the behaviors and attitudes in daily

lives, such as “what I can do and what I should do.” In my presentation, I will refer to students’ specific sentences.

REFERENCES

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A Pilot Study of Biodiversity Conservation Education for STEM: Attitudes Promoted among Japanese Female Students

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Research Background

STEM, a cross-curricular approach, will help to develop educational programs for sustainable global environment problems. UNESCO (2021) and MEXT in Japan (2022) note that educational measures to spread the concept of biodiversity conservation among people are urgently needed.

Research Program and Activity Design for Students

The author has developed a pilot active learning program for university female students to explore biodiversity issues in terms of wildlife. The topic is ‘endangered species’, since the word of ‘biodiversity’ does not lead an concrete image while ‘extinction’ makes a sense for the public people (Yoro, 2003). The students generally have some interest in animal issues. In 2021, 75 students were participated and created the ‘Endangered Species Information Cards [ESIC]’ (Fig 1).

Research Focus and Method

This research focused on what kind of awareness/impact the participants students could have after the program. The analysis is based on text mining method, which extracts implicit knowledge from textual data (Sharda & Chen, 2019).

This ESIC creation activity was included in 90minx15 lessons for 20 students.

The students’ descriptions of “what I can do to solve the endangered species problem,” which they wrote after creating the ESIC were analyzed.

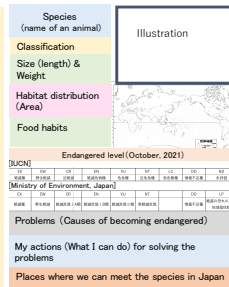


Figure 1. ESIC

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Results & Conclusion

The text mining method of students’ internal thoughts were clarified by terms and their connections. There are nine co-occurrence networks of the terms (Fig 2). The N1, N2, and N3 is a group containing 7 or more terms. There are terms of purchasing of goods (N1), taking in alien species and breeding pets (N2), and reducing waste, paper, and plastic used to solve global warming (N3). N4, N5, and N6 is a group containing 6 terms. Students realize the importance of knowing the endangered status of species and preventing poaching (N4 and N5). They also found that actions such as donating and participating in activities (N6). N7 suggests that students’ typical image of action to contribute to conserving biodiversity is taking trash to home.

The pilot program of ESIC creation may promote good attitudes among people of what we should do for biodiversity conservation, which has not had concrete ideas of educational solution.

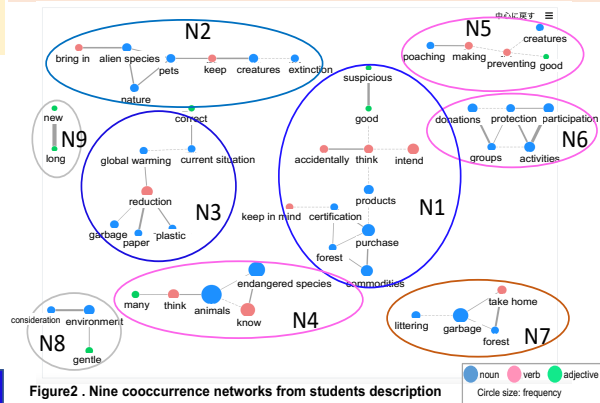


Figure2 . Nine cooccurrence networks from students' description