

# HOW DOES FIRST-YEAR SCITECH EXPERIENCE OF PROFESSIONAL DEVELOPMENT AFFECT MATHEMATIC EDUCATION?

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This paper reports professional development practices of first-year college education based on the perspective of science, technology, engineering, and mathematics (STEM) education. Meaningful science for young children builds on the emotional underpinnings of their curiosity and concerns about the everyday world, and their pleasure in exploring it (Harlan & Rivkin, 2003). Through the implementation of the course named 'Introductory Study on Natural Environment and Science in Childhood Education', Fujitani (2022) has engaged in activities for first-year teacher-education students to cultivate STEM interests and to build a foundation in mathematics for primary education.

We describe an example of mathematical modelling in practice in this course as follows.

During a visit to the garden inside the shrine (Figure 1), students worked on the estimation of the natural regeneration of forests after learning forester's research practice at the time of afforestation for the shrine. The students attempted to find the time period of regeneration toward the climax stage of forests.

Students also undertook an activity to build an antenna for digital television broadcasting (Figure 2). The size of the loop antenna they made was defined by the frequency band of the radio waves they planned to receive. Following the instruction, the students cut out aluminium foil according to the wavelength of the radio waves to produce their antennas.

In addition, the students also have engaged in the experiences of mammalian and aquatic animal rearing and cultivation of vegetables and flowers through this course, for instance. By introducing students to these scientific experiences early on, the students, who will be teachers, are able to build the foundation for developing scientific thinking and inquiry skills that would be the scaffold for the spark of the student's interest and excitement in STEM fields. The course makes teacher-training students foster a love and curiosity for science, and encourages them to pursue further STEM learning opportunities, and it can work as an access of mathematical modelling for them. It can also affect the children who are taught by the students as teachers in future likewise.



Figure 1: Visit for nature observation



Figure 2: Making TV antennas

## References

- Fujitani, S. (2022). First-year education to raise awareness of nature and science in childhood education (*in Japanese*). *Human and Education: Yearbook of Mejiro University Research Institute of Higher Education*, 16, 104-110.
- Harlan, J.D., & Rivkin, M.S. (2003). *Science experiences for the early childhood years: an integrative affective approach*. Prentice Hall.