

Practical Actions and Challenges of Ocean Literacy and Interdisciplinary Teaching Competence for Educators in Taiwan

*YEN-LING LIN¹, Cheng-Chieh Chang², Liang-Ting Tasi²

1. Taiwan Marine Education Center, National Taiwan Ocean University, 2. Institute of Education & Center of Teacher Education, National Taiwan Ocean University

The internationalization of issue-based education has become an important feature of Taiwan's education reform, and marine education, as part of international issue-based education, has been incorporated into the curriculum development of various learning areas in Taiwan since 2011 through the 12-year national education reform. However, looking back at the past teacher training process, there was no subject training on the integration of the issue. In addition, the complex and interdisciplinary nature of marine education has led to many teachers not having the confidence to teach courses related to marine education without prior teaching experience, thus making the implementation of the curriculum a challenge.

In order to achieve this goal, this study takes into account the 2015 Professional Standards for Teachers by the United Nations Educational, Scientific and Cultural Organization (UNESCO), which focuses on student learning, curriculum adaptation, critical competencies, affective attitudes, integrated development, and practice. The six principles of the Professional Standards for Teachers, namely focusing on student learning, transforming curriculum and teaching, possessing key competencies, cultivating an affective attitude, focusing on comprehensive development, and emphasizing practice and innovation, have been used to develop a training mechanism for marine educators, to strengthen teachers' marine literacy and cross-disciplinary curriculum development skills through multi-day training courses, to enhance their effectiveness in teaching and learning of marine education issues, and to analyze their learning outcomes and applications.

The methodology of the study was both qualitative and quantitative. In the quantitative part, a questionnaire survey was conducted with 70 participants of the marine education course on climate change and fish-eating education from 2021 to 2023, and in-depth interviews were conducted with 6 of them to analyze the teaching experience before the study, the experience and feeling of the study, and the teaching practice after the study.

The results of the study showed that: (1) in terms of marine literacy, the participants' understanding of the relationship between humans and the marine environment and living organisms, as well as the protection of their own daily lives and actions, through the contextualized experiences and practical training arrangements in museums and community visits, helped to enhance the teaching and learning of educators on the use of resources in the marine arena, and provided them with a professional understanding of marine education as well as relevant teaching skills and strategies; (2) in terms of marine education, the participants' understanding of marine education was enhanced, and the participants' understanding of marine education and related teaching skills and strategies were strengthened. (3) In terms of community-led learning, trainees make use of the experience of building learning communities to collaborate and exchange teaching demonstrations to promote the development of cross-disciplinary curriculum modules and integration of resources, and to improve the feasibility and sustainability of teaching applications; (4) In terms of thematic teaching design, trainees make use of systematic thematic inquiry and environmental thinking to link up different disciplines to help teachers transform marine literacy into curriculum content for different learning targets, as well as to enhance the effectiveness of teaching and learning. The linking of different subject areas helps teachers to transform ocean literacy into curriculum content suitable for different learning targets, as well as to enhance pedagogical

innovation and community leadership; (5) Common challenges in implementing ocean education include limited curriculum time, lack of teaching materials, lack of funding and equipment in the educational environment, the need for interdisciplinary collaboration among educators, and difficulties in arranging actual teaching venues.

Overall, the results of this study can be used as a curriculum reference for future professional development of marine educators. By deepening educators' understanding of marine disciplines, familiarizing them with the issues and strategies of teaching and learning, we hope to realize the sustainable development of marine education in Taiwan in both formal and informal education settings.

Keywords: Ocean literacy, Issue-based teaching, Community of practice, Teacher professional growth