

# 自然與生活科技領域「臺灣水生植物」之多元 教材與融入環境教育教學應用初探

李翠玲

國立清華大學特殊教育學系教授

## 摘要

本研究旨在初探臺灣水生植物之多元教材現況與瞭解臺灣水生植物應用於環境教育教學情形。資料蒐集主要透過文件、訪談與校園觀察，共有5位國小老師參與訪談，觀察場域為學校水域環境，以質性分析為主。研究結果分為二大類：(一)臺灣水生植物之多元教材現況：大致可歸納五類，並可納入三大領域，即文學教材(童話故事、報導文學、繪本、詩)、科學教材(科普)與生活教材(食譜)等；各類教材的量上仍舊十分不足，亟待開發。(二)臺灣水生植物融入環境教育之教學應用：多元教材在自然課可作為引起動機之教材；水生植物納入自然課、社會課、藝術與人文、特殊教育等領域是透過生態影片、戶外教學體驗、美術創作與特教課程調整等方式進行融入環境教育；外來種與原生種的介紹則可使用社會資源，例如邀請保育團體來校解說。

**關鍵字：**水生植物、生物多樣性、多元教材、環境教育

---

投稿日期：2018年09月07日；接受日期：2019年02月11日

## 柒、參考文獻

- 臺灣植物同好會(2009)。臺灣野生食用植物圖錄。臺北市：玉山社。
- 【Taiwan Plants Society (2009). *Catalogue of Taiwan wild edible plants*. Taipei City: Tipi.】
- 吳良棟、任娣(1996)。鮮花與綠葉。臺北市：長圓。
- 【Wu, L. D., & Ren, D. (1996). *Fresh flowers and green leaves*. Taipei City: Long & Round.】
- 吳佩俞(譯)(2007)。身邊雜草的愉快生存法(原作者：稻垣榮洋)。臺中市：晨星。  
(原作出版年 2003)
- 【Wu, P. Y. (2007). (Trans.). *Happy survival ways of the weeds in nearby* (Original author: H. Inagaki). Taichung: Morning Star.】
- 李松柏(1999)。臺中縣的濕地與水生植物。臺中縣：臺中縣自然生態保育協會。
- 【Li, S. P. (1999). *Wetland and aquatic plants of Taichung County*. Taichung County: Society of Natural Ecological Conservation.】
- 李松柏(2005)。臺灣水生植物地圖。臺中市：晨星。
- 【Li, S. P. (2005). *Aquatic plants and map of Taiwan*. Taichung City: Morning Star.】
- 李松柏(2007)。臺灣水生植物圖鑑。臺中市：晨星。
- 【Li, S. P. (2007). *Aquatic plants of Taiwan*. Taichung City: Morning Star.】
- 李松柏、曾美雲(2004)。和水生植物做朋友。臺北縣：人人。
- 【Li, S. P. & Tseng, M. Y. (2004). *Be friends with aquatic plants*. Taipei County: Jen Jen.】
- 李曉菁(2000)。小草的旅行—發現水生植物。臺北市：田野影像。
- 【Li, S. J. (2000). *The trip of the tiny grass – discovering the aquatic plants*. Taipei City: Field Picture.】
- 林明瑞、王聖賢(2006)。「福寶濕地自然保育課程」實驗教學對國小中、高年級學童在濕地自然保育認知、態度之影響。環境教育研究, 4(1), 103-146。  
doi:10.6555/JEER.4.1.103
- 【Lin, M. R., & Wang, S. H. (2001). An experimental teaching study of conservation curricula of the Fubow wetland on the influences for 3rd to 6th graders' cognitions, attitudes of

wetland conservation. *Journal of Environmental Education Research*, 4(1), 103-146.  
doi:10.6555/JEER.4.1.103】

林金蓮(2003)。**桃園地區國小學童對水生植物認知情形之研究**。未出版之碩士論文，臺北市立師範學院，臺北市。

【Lin, J. L. (2003). *A study of elementary students' cognition on aquatic plant in Tao Yuan area*. Unpublished master thesis. Taipei Municipal Teachers College, Taipei City.】

林春吉(2000)。**臺灣水生植物(1)-自然觀察圖鑑(2)-溼地生態導覽**。臺北市：田野影像。

【Lin, C. C. (2000). *Aquatic plants of Taiwan (1) –Atlas of observation in nature (2)-Guide of ecology in wetland*. Taipei City: Green World.】

林春吉(2005)。**臺灣的水生與濕地植物**。臺北市：綠世界。

【Lin, C. C. (2005). *Aquatic & wetland plants of Taiwan*. Taipei City: Green World.】

林春吉(2009a)。**臺灣水生與濕地植物生態大圖鑑(上)(中)(下)**。臺北市：天下文化。

【Lin, C. C. (2009a). *A field guide to aquatic & wetland plants of Taiwan* (Vol. 1-3). Taipei City: Bookzone.】

林春吉(2009b)。**水生植物**。臺北市：親親文化。

【Lin, C. C. (2009b). *Aquatic plants*. Taipei City: Kiss Nature.】

卓明賢(2009)。**生態教材園融入自然領域課程對學生科學學習成效之探究~以水生植物池為例**。未出版之碩士論文，國立臺南大學，臺南市。

【Cho, M. H. (2009). *The scientific learning performance of the students in the science and technology classes integrated with an eco-education garden with the example of the aquatic plant pond*. Unpublished master's thesis, National University of Tainan, Tainan City.】

洪國維(2008)。**臺北縣國民小學生態池規劃與管理之研究**。未出版之碩士論文，國立臺北教育大學，臺北市。

【Hung, K. W. (2008). *Research on ecological pond scheme and management of Taipei county elementary schools*. Unpublished master thesis, National Taipei University of Education, Taipei City.】

洪麗瑜(2016)。多文本閱讀策略教學在國中歷史科教學之運用。人文與社會科學簡訊，17(2)，33-40。

【Hung, L. Y. (2016). Applying multiple-text reading strategy in teaching history in the junior high school. *Humanities and Social Sciences Newsletter*, 17(2), 33-40.】

高嘉菱、吳玟萱(2009)。哇！有趣的水生植物。臺北市：中華民國荒野保護協會。

【Kao, G. L., & Wu, W. S. (2009). *Wow! Interesting aquatic plants*. Taipei City: The Society of Wilderness.】

國家教育研究院(2018)。十二年國民基本教育領域課程綱要—核心素養發展手冊。取自 <http://www.naer.edu.tw/files/15-1000-9423,c1180-1.php?Lang=zh-tw>

【National Academy for Educational Research (2018). *12-year education curriculum guide – the manual of developing the key competencies*. Retrieved from <http://www.naer.edu.tw/files/15-1000-9423,c1180-1.php?Lang=zh-tw>】

教育部暨國家教育研究院(2011)。國小中年級自然與生活科技領域科學閱讀資料集。新北市：教育部暨國家教育研究院。

【Ministry of Education and National Academy for Educational Research (2011). *Reading collection of science in science and technology domain for 3rd & 4th graders*. New Taipei City: Ministry of Education and National Academy for Educational Research.】

梅菲比(2002)。失眠的荷花。新北市：泛亞國際文化科技。

【Mei, F. B. (2002). *Sleepless lotus*. New Taipei City: Pan Asia International Culture and Tech.】

許毅璿(2005)。全球野生動植物瀕危現況與相關活動訊息之追蹤（上）。取自 <https://e-info.org.tw/column/biodiv/2005/bi05120101.htm>

【Hsu, Y.-S. (2005). Tracking the status of endangered wildlife and related activities in the world (I). Retrieved from <https://e-info.org.tw/column/biodiv/2005/bi05120101.htm>】

陳世輝(1999)。東部水生植物圖譜。花蓮縣：國立花蓮師範學院。

【Chen, S. H. (1999). *Atlas of the aquatic plants in the eastern Taiwan*. Hualien County: National Hualien Teachers College.】

陳威伯、施靜宜(2015)。餐芳譜。臺北市：城邦文化。

【Chen, W. P. & Shih, J. Y. (2015). *Flower, cook & food recipe*. Taipei: Cite Publishing Ltd.】

陳增智(2008)。藥用植物的故事 50 則。臺北縣：旗林。

【Chen, Z. J. (2008). *Fifty stories of medicine plants*. Taipei County: Chi Lin.】

陳德鴻(2011)。萍蓬草田野筆記。桃園縣：桃園縣政府文化局。

【Chen, D. H. (2011). *The field note book for Taiwan yellow waterlily*. Taoyuan County: Department of Cultural Affairs, Taoyuan.】

陳黎君(2003)。情意教育融入「水中生物」課程之教學探討。未出版之碩士論文，國立臺北師範學院，臺北市。

【Chen, L. C. (2003). *The study of integrating affective education into the instruction of the topic "living creatures in water"*. Unpublished master's thesis, National Taipei Teachers College, Taipei City.】

黃朝慶(2009)。臺灣水生植物多樣性及其保育。載於黃鵬，林學詩，張建生，陳吉村，林文華(主編)，水生植物多樣性開發與利用研討會專刊(pp. 39-54)。花蓮：行政院農業委員會花蓮區農業改良場。

【Huang, C. C. (2009). The biodiversity and conservation of Taiwan aquatic plants. In P. Huang, S.-S. Lin, C.-S. Chang, C.-T. Chen, & W.-W. Lin (eds.), *Symposium on the development and application of aquatic plant resources* (pp. 39-54). Hualien: Hualien District Agricultural Research and Extension Station, COA.】

黃朝慶、李松柏(1999)。臺灣珍稀水生植物。臺中縣：清水鎮牛罵頭文化協進會。

【Huang, C. C., & Li, S. P. (1999). *Rare aquatic plants of Taiwan*. Taichung County: Gomach Culture Association.】

新竹人智學會譯(2012)。植物(原作者：C. Kovacs)。臺北市：旺旺(原著出版年 2005)。

【Hsinchu Anthroposophical Association (Trans.)(2012). *Botany*. (Original author: C. Kovacs). Taipei City: Wang Wang. (Original publication year: 2005)】

楊遠波、顏聖紘、林仲剛(2001)。臺灣水生植物圖誌。取自 <http://subject.forest.gov.tw/species/aquaplants/index-1.htm>

【Yang, Y. P., Yen, S. H., & Lin, J. G. (2001). *Illustrated guide to aquatic plants of Taiwan*. Retrieved from <http://subject.forest.gov.tw/species/aquaplants/index-1.htm>】

- 董淑炎(2014)。400種野菜圖典百科。臺北市：佳魁文化。
- 【Dong, S. Y. (2014). *400 edible wild herbs*. Taipei City: Top Work Culture.】
- 劉克襄(2006)。失落的蔬果。臺北市：二魚。
- 【Liu, K. S. (2006). *The lost vegetable and fruits*. Taipei City: 2 fish.】
- 劉嬋禎(2008)。自然與生活科技領域應用無線網路之教學研究以校園水生植物為例。未出版之碩士論文，國立新竹教育大學，新竹市。
- 【Liu, Y. Z. (2008). *Aquatic plants learning of science and technology learning area based on wireless network*. Unpublished master's thesis, National Hsinchu University of Education, Hsin-chu City.】
- 潘淑琦(2006)。資訊融入「自然與生活科技」領域之行動研究－以探究教學活動設計為例。生活科技教育，39(7)，87-107。doi:10.6232/LTE.2006.39(7).9
- 【Pan, S. C. (2006). Action research of using information technology in 'Science and Living Technology Education – An example of inquiry model in biology learning. *Living Technology Education*, 39(7), 87-107.】
- 鄭傳榮(2004)。由經營國小生態教材園融入自然與生活科技學習領域教學之研究。未出版之碩士論文，國立新竹師範學院，新竹市。
- 【Jeng, C. R. (2004). *The research on immersing the nature and academic learning field of living technology by managing the ecological teaching material zone in elementary school*. Unpublished master's thesis, National Hsinchu Teachers College, Hsin-chu City.】
- 賴啟文(2006)。水域生物多樣性教學對國小學童生態保育認知、態度及行為意向之影響。未出版之碩士論文，臺北市立教育大學，臺北市。
- 【Lai, C. W. (2006). *An experimental instruction towards wildlife conservation for elementary school students and to evaluate the effect on students' wildlife conservation knowledge, attitude and behavior intention*. Unpublished master's thesis, Taipei Municipal University of Education, Taipei.】
- 簡錦玲(2006)。野菜美食家。臺北市：天下遠見。
- 【Jian, J. L. (2006). *Seasonal recipes for edible wild plants in Taiwan*. Taipei City: Bookzone.】
- 羅廷瑛(2015)。溝通式閱讀科學教材教學方案對國小四年級學生科學閱讀表現

之影響。新竹教育大學教育學報，32(1)，93-126。doi:  
10.3966/199679772015063201004

【Luo, T. Y. (2015). Effect of a communicative reading program on the science reading performance of fourth-grade students. *Educational Journal of NHCUE*, 32(1), 93-126. doi: 10.3966/199679772015063201004】

蘇宏仁(2012)。環境教育與永續發展。臺北市：華都文化。

【Su, H. J. (2012). *Environmental education and sustainable development*. Taipei: Farseeing Publishing Co.】

Gladstone, W., Stanger, R., & Phelps, L. (2006). A participatory approach to university teaching about partnerships for biodiversity conservation. *Australian Journal of Environmental Education*, 22(2), 21-31.

Knowlton, N. (2008). Marine biodiversity in jeopardy. *American Prospect*, 19(12), 15-16.

Mallow, D. (1994). Biodiversity. *The Science Teacher*, 61(4), 19-21.

Mueller, M. P. (2009). Educational reflections on the “ecological crisis”: Ecojustice, environmentalism, and sustainability. *Science & Education*, 18(8), 1031-1056. doi: 10.1007/s11191-008-9179-x

Route, J. F., Britt, M. A., Mason, R., & Perfetti, C. (1996). Using multiple sources of evidence to reason about history. *Journal of Educational Psychology*, 88, 478-493.

Stahl, S., Hynd, C., Britton, B., McNish, M., & Bosquet, D. (1996). What happens when students read multiple resource documents in history? *Reading Research Quarterly*, 31, 430-456.

Wilson, E. O., & Peter, F. M. (Eds.) (1988). *Biodiversity*. Washington, DC: National Academy of Science.

Wilson, E. O. (1992). *The diversity of life*. Cambridge, MA: Belknap press of Harvard University Press.

Zemits, B. (2006). Biodiversity: Who knows, who cares? *Australian Journal of Environmental Education*, 22(2), 99-107.

**作者簡介：**

李翠玲 國立清華大學特殊教育學系教授

電話：(03) 571-5131 Ext. 73311

電子郵件：tripo@mail.nd.nthu.edu.tw

通訊處：30014 新竹市南大路 521 號

**Lee, Tsuey-Ling**

Professor, Department of Special Education, National Tsing Hua University

Tel: (03) 571-5131 Ext. 73311

E-mail: tripo@mail.nd.nthu.edu.tw

Address: No.521 Nan-Da Road, HsinChu City 30014



## **A Preliminary Study on Multiple Teaching Materials of “Taiwan Aquatic Plants” in Science and Technology Domain and Applications in the Environmental Education**

**Tsuey-Ling Lee**

*Professor, Department of Special Education, National Tsing Hua University*

### **Abstract**

The purposes of this study were to explore the current situation of the multiple teaching materials of Taiwan aquatic plants, and to understand their applications in environmental education. Data included documents, interviews and observations in the campus. Five elementary school teachers participated in the interviews. The observation fields included the aquatic environments in their schools. Qualitative analysis was conducted mainly. The results were divided into two sections. The first was the current situation of the multiple teaching materials of Taiwan aquatic plants. They could be broadly classified into five categories and grouped into three major areas: literary texts (fairy tales, reportage, picture books and poems), science texts (popular science) and daily life texts (recipes). The multiple teaching materials of Taiwan aquatic plants were insufficient and needed to be further developed. The second section was the use of teaching materials in environmental education, which could be used to increase motivation in Science. The integration of aquatic plants into the environmental education in domains of Science, Social Courses, Art and Humanities and Special Education could be carried out through films about ecology, outdoor teaching experiences, artistic creation and the adjustment in special education courses. Social resources could be used to introduce exotic species and native species, for example, by inviting conservation groups to school to give explanations.

**Keywords:** aquatic plants, biodiversity, multiple teaching materials, environmental education