

以環境議題為主的暑期營隊活動對國小學童情境 興趣表現之探究

蔡執仲^{1*}、鄭丞棋²、鄭瑞洲³

¹. 國立高雄師範大學科學教育暨環境教育研究所助理教授

². 國立高雄師範大學科學教育暨環境教育研究所研究生

³. 國立科學工藝博物館科技教育組助理研究員

摘要

本研究實施於南投縣某國小舉辦三天兩夜的夏令營，教學對象為來自都市地區的國小三到六年級學生，共 68 名。營隊課程是以博物館資源所設計的「生物多樣性」議題為主軸，將日常生活的環境議題融入活動之中，營造出符合學習需求的教學情境。課程包含日間的戶外自然觀察與體驗課程，以及夜間的室內課程活動。活動由學生的先前經驗為出發，依此設計具挑戰性的問題，以議題讓學生在小組中進行討論擴展學習成效。結果發現：融入個人生活的環境議題與田野經驗，可建構出合宜的學習情境，學生能主動連結以往的生活經驗，並與同儕討論如何解決問題，藉由分享彼此經驗，研擬出合適的行動策略，因而引發情境興趣。學生互動能使整體學習情境更多樣化，並能提供機會給學生運用所學知識。學生對特定環境議題呈現高度的情境興趣，並對環境採取更為友善的態度，進而有機會發展持續關懷環境的個人興趣。

關鍵字：生物多樣性、情境興趣、博物館、營隊教學

投稿日期：2017 年 10 月 04 日；接受日期：2018 年 02 月 07 日

* 通訊作者

成為知識共構的平台。在提問時必須提供難度較高的挑戰，藉此刺激學生與同儕分享想法，聚焦討論並形成共識來解決問題，如此的學習情境可提升學生的情境興趣，激盪出更多元想法。而針對所討論的環境議題，從議題中找出影響情境的關鍵因素。讓學生提出問題的解決策略，如 Schraw 與 Lehman (2001)指出真正的學習成效，是能在情境間進行轉移，也就是能應用知識來擬定解決問題的策略。

營隊除提供戶外的自然經驗外，另外要評估學生的先前經驗和學習狀態，以決定要提供哪些教具和策略有助於學習。教學者扮演引導的角色是協助學生進行討論，引導學生在參照別人的看法後，改變原有的想法，甚至會評價自己的行為、態度、價值，以及預測自己的作法對環境有可能產生的後果，整體的教學環境在師生互動中形塑出符合學習需求的情境。

本研究運用科工館的資源設計營隊課程，藉由大學環境教育研究團隊和實務工作者的互動，擬出對特定環境教育議題的學習方案，所設立的議題是符合在地經驗，讓整體活動聚焦，有助於學生在認知的過程中，進行學習的轉移，也能使學生更加關心生活周遭的環境，引發學生對學習科學的正向態度。建議在規劃營隊課程，必須結合戶外課程和室內課程，並要依照學科內容設立議題，並做為活動主軸，讓學生建構出符合特定情境的實務知識。如此在教學成效上，方能達到如 Higgins (2009)指出，學生若能專注於議題討論，可形成將理解、態度、情緒和知識融合為一體的價值體系。對未來研究的建議則是，因時間與人力的因素，並未探討學生結束營隊課程回到校園後，是否發展出持續關懷環境議題的個人興趣，這可成為未來持續探討的方向。

陸、參考文獻

- 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
- 林嘉男、許毅璿(2007)。人與環境之論述：釐清「地方感」、「地方依附」與「地

- 方依附」在環境研究上的角色。**環境教育研究**，5(1)，41-71。doi: 10.6555/JEER.5.1.041
- 林琦峰、張俊彥(2013)。運用「嵌入式評量」發展天文營隊課程—建立天文教育新模式。**科學教育月刊**，364，24-39。
- 陳向明(2002)。**社會科學質的研究**。臺北市：五南。
- 許世璋、徐家凡(2012)。池南自然教育中心一日型方案「天空之翼」對於六年級生環境素養之成效分析。**科學教育學刊**，20(1)，69-94。doi: 10.6173/CJSE.2012.2001.04
- 許世璋、黃怡華(2017)。林務局池南自然教育中心環境教育遊戲方案對於六年級生環境素養之成效分析。**科學教育學刊**，25(2)，169-196。doi: 10.6173/CJSE.2017.2502.04
- 許毅璿、盧居煒、李芝瑩、黃昱翔、江玉玲(2012)。英國「教室外學習(Learning Outside the Classroom)」發展理念與品質標章。**台灣林業**，38(5)，50-59。
- 教育部(2005)。**國民中小學九年一貫課程總綱**。臺北市：教育部。
- 教育部(2012)。**國民中小學九年一貫重大議題：環境教育**。臺北市：教育部。
- 曾鈺琪、王順美(2013)。都市青少年自然經驗發展特質之多個案研究。**環境教育研究**，10(1)，65-98。doi: 10.6555/JEER.10.1.065
- 曾啟銘、汪靜明(2015)。比較環境體驗與傳統課室教學對國小中年級學童地方依附與負責任環境行為之影響。**環境教育研究**，11(1)，31-66。doi: 10.6555/JEER.11.1.031
- 曾啟銘、汪靜明(2015)。一日型環境教育方案介入對兒童地方依附與負責任環境行為之影響：以池南自然教育中心為例。**環境教育研究**，11(2)，5-38。doi: 10.6555/JEER.11.2.005
- 鄭瑞洲、洪振方、黃台珠(2011)。情境興趣—制式與非正式課程科學學習的交會點。**科學教育月刊**，340，2-10。
- 賴麗珍(譯)(2008)。**重理解的課程設計(Understanding by Design)**(原作者：Grant Wiggins & Jay McTighe)。臺北：心理。
- 鐘敏綺、張世忠(2002)。奠基於建構主義的 STS 於自然與生活科技領域之應用。

科學教育，254，2-15。

蔡執仲、段曉林、靳知勤(2009)。進行「巢狀探究教學模式」對國二學生 學習環境感知之影響。屏東教育大學學報：理工類，29，79-112。

Alagona, P. S., & Simon, G. L. (2010). The role of field study in humanistic and interdisciplinary environmental education. *Journal of Experiential Education*, 32(3), 191-206. doi: 10.5193/JEE.32.3.191

Bogner, F. X. (1998). The influence of short-term outdoor ecology education on long-term variables of environmental perspective. *The Journal of Environmental Education*, 19(4), 17-29. doi: 10.1080/00958969809599124

Chawla, L. (1998). Significant life experiences revisited: a review of research on sources of environmental sensitivity. *Environmental education Research*, 4(4), 369-382. doi: 10.1080/1350462980040402

Cox-Petersen, A. M., & Pfaffinger, J. A. (1998). Teacher preparation and teacher-student interactions at a discovery center of natural history. *Journal of Elementary Science Education*, 10(2), 20-35. doi: 10.1007/BF03173782

Collado, S., Staats, H., & Corraliza, J. A. (2013). Experiencing nature in children's summer camps: affective, cognitive and behavioral consequences. *Journal of Environmental Psychology*, 33, 37-44. doi: 10.1016/j.jenvp.2012.08.002

Dohn, N. B. (2011). Situational interest of high school students who visit an aquarium. *Science Education*, 95(2), 337-357. doi: 10.1002/sce.20425

Duerden, M. D., & Witt, P. A. (2010). The impact of direct and indirect experiences on the development of environmental knowledge, attitudes, and behavior. *Journal of Environmental Psychology*, 30(4), 379-392. doi: 10.1016/j.jenvp.2010.03.007

Emmons, K. M. (1997). Perceptions of the environment while exploring the outdoors: a case study in Belize. *Environmental Education Research*, 3(3), 327-344. doi: 10.1080/1350462970030306

Eshach, H. (2007). Bridging in-school and out-of-school learning: formal, non-formal, and informal education. *Journal of Science Education and Technology*, 16(2),

- 171-190. doi: 10.1007/s10956-006-9027-1
- Farmer, J., Knapp, D., & Benton, G. M. (2007). An elementary school environmental education field trip: long-term effects on ecological and environmental knowledge and attitude development. *The Journal of Environmental Education*, 38(3), 33-42. doi: 10.3200/JOEE.38.3.33-42
- Hamilton-Ekeke, J.-T. (2007). Relative effectiveness of expository and field trip methods of teaching on students' achievement in ecology. *International Journal of Science Education*, 29(15), 1869-1889. doi: 10.1080/09500690601101664
- Hidi, S. (1990). Interest and its contribution as a mental resource for learning. *Review of Educational Research*, 60(4), 549-571. doi: 10.2307/1170506
- Hidi, S. (2001). Interest, reading, and learning: theoretical and practical considerations. *Educational Psychology Review*, 13(3), 191-209.
- Hidi, S., & Renninger, K. A. (2006). The four-phase model of interest development. *Educational Psychologist*, 41(2), 111-127. doi: 10.1207/s15326985ep4102_4
- Higgins, P. (2009). Into the big wide world: sustainable experiential education for the 21st century. *Journal of Experiential Education*, 32(1), 44-60. doi: 10.5193/JEE.32.1.44
- Hill, A. (2013). The place of experience and experience of place: intersections between sustainability education and outdoor learning. *Australian Journal of Environmental Education*, 29(1), 18-32. doi: 10.1017/aee.2013.13
- Hofstein, A., & Rosenfeld, S. (1996). Bridging the gap between formal and informal science learning. *Studies in Science Education*, 28(1), 87-112. doi: 10.1080/03057269608560085
- Jensen, B. B., & Schnack, K. (1997). The action competence approach in environmental education. *Environmental Education Research*, 3(2), 163-178. doi: 10.1080/13504620600943053
- Jepson, D., & Sharpley, R. (2014). More than sense of place? Exploring the emotional dimension of rural tourism experiences. *Journal of Sustainable Tourism*, 23(8-

- 9), 1157-1178. doi: 10.1080/09669582.2014.953543
- Knogler, M., Harackiewicz, J. M., Genefurtner, A., & Lewalter, D. (2015). How situational is situational interest? Investigating the longitudinal structure of situational interest. *Contemporary Educational Psychology*, 43, 39-50. doi: 10.1016/j.cedpsych.2015.08.004
- Kollmuss, A., & Agyeman, J. (2002). Mind the gap: why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, 8(3), 239-260. doi: 10.1080/13504620220145401
- Millar, M. G., & Millar, K. U. (1996). The effect of direct and indirect experience on affective and cognitive responses and attitude-behavior relation. *Journal of Experimental Social Psychology*, 32(6), 561-579. doi: 10.1006/jesp.1996.0025
- National Research Council (2009). *Learning science in informal environments: people, places, and pursuits*. Washington, D. C.: National Academy Press.
- Orion, N. (1994). A short-term and long-term study of a science investigation project in geology, used by non-science high school students. *Research in Science and Technological Education*, 12, 203-223. doi: 10.1080/0263514940120209
- Orion, N., & Hofstein, A. (1994). Factors that influence learning during a scientific field trip in a natural environment. *Journal of Research in Science Teaching*, 31(10), 1097-1119. doi: 10.1002/tea.3660311005
- Palmer, D., Dixon, J., & Archer, J. (2017). Using situational interest to enhance individual interest and science-related behaviors. *Research in Science Education*, 47(4), 731-753. doi: 10.1007/s11165-016-9526-x
- Prather, J. P. (1989). Review of the value of field trips in science instruction. *Journal of Elementary Science Education*, 1(1), 10-17. doi: 10.1007/BF03172958
- Priest, S. (1986). Redefining outdoor education: a matter of many relationships. *The Journal of Environmental Education*, 17(3), 13-15. doi: 10.1080/00958964.1986.9941413

- Ramey-Gassert, L., Walberg III, H. J., & Walberg, H. J. (1994). Reexamining connections: museums as science learning environments. *Science Education*, 78(4), 345-363. doi: 10.1002/sce.3730780403
- Rennie, L. J., & Johnston, D. J. (2004). The nature of learning and its implications for research on learning from museums. *Science Education*, 88(s1), S4-S16. doi: 10.1002/sce.20017
- Renninger, K. A. (2000). Individual interest and its implications for understanding intrinsic motivation. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation* (pp. 373-404). Cambridge, MA: Academic Press. doi: 10.1016/B978-012619070-0/50035-0
- Rotgans, J. I., & Schmidt, H. G. (2014). Situational interest and learning: Thirst for knowledge. *Learning and Instruction*, 32, 37-50. doi: 10.1016/j.learninstruc.2014.01.002
- Schiefele, U. (1991). Interest, learning, and motivation. *Educational Psychologist*, 26(3), 299-323. doi: 10.1207/s15326985ep2603&4_5
- Schraw, G., & Lehman, S. (2001). Situational interest: a review of the literature and discussions for future research. *Educational Psychology Review*, 13(1), 23-52.
- Sobel, D. (1996). *Beyond esophoria: Reclaiming the heart in nature education*. Great Barrington, MA: The Orion Society.
- Sobel, D. (2004). *Place-based education: connecting classroom and communities*. Great Barrington, MA: The Orion Society.
- Sturm, H., & Bogner, F. X. (2010). Learning at workstations in two different environments: a museum and a classroom. *Studies in Educational Evaluation*, 36(1-2), 14-19. doi: 10.1016/j.stueduc.2010.09.002
- Tran, L. U. (2007). Teaching science in museums: the pedagogy and goals of museum educators. *Science Education*, 91(2), 278-297. doi: 10.1002/sce.20193
- Tran, X., & Ralston, L. (2006). Tourist preferences influence of unconscious needs. *Annals of Tourism Research*, 33(2), 424-441. doi: 10.1016/j.annals.2005.10.014

作者簡介：

蔡執仲 國立高雄師範大學科學教育暨環境教育研究所助理教授

電話：0938-674-531

電子郵件：cctsai.se@gmail.com

通訊處：824 高雄市燕巢區深中路 62 號

鄭丞棋 國立高雄師範大學科學教育暨環境教育研究所研究生

電話：0975-800-208

電子郵件：bear1002011@gmail.com

通訊處：824 高雄市燕巢區深中路 62 號

鄭瑞洲 國立科學工藝博物館科技教育組助理研究員

電話：0928-729-612

電子郵件：adam@mail.nstm.gov.tw

通訊處：807 高雄市三民區九如一路 720 號

Tsai, Chih-Chung

Assistant Professor, Graduate Institute of Science Education & Environmental Education, National Kaohsiung Normal University

Tel: 0938-674-531

E-mail: cctsai.se@gmail.com

Address: No.62, Shenhong Rd., Yanchao Township, Kaohsiung County 824, Taiwan (R.O.C.)

Zheng, Cheng-Qi

Graduate student, Graduate Institute of Science Education & Environmental Education, National Kaohsiung Normal University

Tel: 0975-800-208

E-mail: bear1002011@gmail.com

Address: No.62, Shenhong Rd., Yanchao Township, Kaohsiung County 824, Taiwan (R.O.C.)

Zheng, Rui-Zhou

Assistant Researcher, Technology Education Division, National Science and Technology Museum

Tel: 0928-729-612

E-mail: adam@mail.nstm.gov.tw

Address: 720, Jiouru 1st Road, Kaohsiung 80765, Taiwan (R.O.C)

An Investigation of Environmental Issue-based Summer Camp Activities to Elementary School Students' Situational Interests

Chih-Chung Tsai^{1*}, Cheng-Qi Zheng², Rui-Zhou Zheng³

¹ Assistant Professor, Graduate Institute of Science Education & Environmental Education, National Kaohsiung Normal University

² Graduate student, Graduate Institute of Science Education & Environmental Education, National Kaohsiung Normal University

³ Assistant Researcher, Technology Education Division, National Science and Technology Museum

Abstract

This study was conducted in a summer camp held by an elementary school in Nantou County, which last for three days and two nights. The participants were 68 third to sixth grade students. The theme of the lessons given in the camp was "biodiversity," designed by the museum. The daytime lessons included outdoor observations and nature experience; whereas, the evening lessons were indoor learning with group discussions about some challenging questions based on students' prior experiences and in combination with environmental issues faced in daily life. Research results indicated that the camp activities involving environmental issues and field experiences indeed elicited students' situational interests. Students were able to link to their life experiences and discuss about how to solve the problems with their peers. By sharing each other's experiences, appropriate action strategies could be developed. These interactions could make the overall learning environment more diverse, providing students with a chance to apply the knowledge that they have learned. In addition, students showed a high degree of situational interest to specific environmental issues, adopting a more friendly attitude towards the environment which presents an opportunity for developing personal interests in continuous care for the environment.

Keywords: biodiversity, situational interests, museum, camp teaching