

Development of an Evaluation Instrument for Green Building Literacy among College Students in Taiwan

Yi-Lin Jan, Ching Yun University, Taiwan

Ming-Liang Lin, National Kaohsiung Normal University, Taiwan

Ko-Yu Shiao, Ching Yun University, Taiwan

Chia-Chen Wei, Ching Yun University, Taiwan

Li-Ting Huang, Ching Yun University, Taiwan

Quo-Cheng Sung, Ching Yun University, Taiwan

ABSTRACT

The construction industry accounts for a significant amount of the total carbon dioxide emissions. Promoting green building policy is one of the most effective ways to meet the national carbon reduction commitment. It is essential to increase green building literacy among people to achieve success in energy saving and carbon reduction. This study constructed a framework for green building literacy and developed a questionnaire as a tool for measuring college students' green building literacy. The questionnaire was finalized in the format consists of twenty cognitive items and nineteen affective/behavioral items. The full-scale reliability of the trial survey was .90, attesting to the internal consistency of this questionnaire. Exploratory factor analysis was also conducted to attest the construct validity. The preliminary results from the trial surveys showed that green building literacy education should not only focus on students' knowledge but their attitudes and values, and most importantly their green building-related behaviors.

Keywords: Ecology, Energy-Saving, Waste-Reduction, and Health (EEWH) System, Environmental Literacy, Evaluation Instrument, Evaluation Questionnaire, Green Building Literacy

INTRODUCTION

Buildings account for a major part of current carbon consumption. In Taiwan, the construc-

tion industry is directly responsible for 28.8% of the total national carbon dioxide emissions (Lin, 2007). Of the 28.8%, residential use accounts for 11.88% and commercial use accounts for 5.94%, while 9.31% is used for construction material production and 1.49% for construc-

DOI: 10.4018/jthi.2012070104

tional transportation. A similar situation is also found in the United States (Roosa & Jhaveri, 2009; U.S. Department of Energy, 2009) where residential and commercial buildings account for almost 39% of total U.S. energy consumption and 38% of U.S. carbon dioxide emissions; both are higher than industrial use and transportation levels. The residential sector alone contributes over 1.12 billion metric tons of carbon dioxide emissions each year.

Furthermore, total carbon dioxide emissions grew by 136.03% in Taiwan from 1990 to 2008, with an average annual growth rate (AAGR) of 4.93%, of which emissions by the residential and commercial sector grew by 215.26%, with an AAGR of 6.6% (Lu, Tsai, & Hu, 2010). Carbon dioxide emissions in the residential and commercial sector have increased to 30.55%, being second to the industrial sector's 51.92% of Taiwan's total carbon dioxide emissions in 2008. Seeing that energy conservation in the residential and commercial sector plays an important role in implementing the carbon dioxide emissions reduction policy, Taiwan's government initiated a series of green building policies to conform to the international trend toward sustainable development (Huang, Lin, & Ho, 2008; Lin, 2007). The design standards for energy efficiency were officially added to the National Building Code in 1995. The first green building assessment system, comprising seven indicators, was announced in 1999. After three years of practice, the seven indicators were expanded to nine, including "Biodiversity" and "Indoor Environment" indicators. In 2003, the updated assessment system was issued and the term "Green Building" was redefined to refer to a building that meets Ecology, Energy-saving, Waste-reduction, and Health (known as EEWH system) requirements. The government has been actively promoting the green building concept as one of the most effective ways to meet the carbon reduction goal; enhancing people's green building literacy would be an efficient strategy to achieve this aim.

Although green building policy plays an important role in energy and environmental issues, most of the previous studies on envi-

ronmental literacy stressed environmental science, ecology and energy saving (e.g., Coyle, 2004; Hsu, 2003; Hsu & Roth, 1998), and some focused on energy literacy (e.g., Callahan & Anderson, 2007; DeWaters, Powers, & Graham, 2007). Few papers touched upon green building literacy. Neither local nor foreign researchers have made systematic studies on the public understanding of green buildings; nor have they developed specific green building literacy questionnaires or scales.

In view of this, this study aimed to construct a framework for green building literacy and to develop a questionnaire as a tool for measuring citizens' green building literacy. Employing the Delphi method and using consensus on the part of an expert panel, the study clarifies the definition of green building literacy and establishes the framework for green building literacy, to serve as fundamental references for developing the green building literacy questionnaire. This paper reports the first phase of a five-year integrated project and details the process of developing a valid and reliable measure of green building literacy for college students; it is meant to serve as a guidepost for developing the actual survey instrument of citizens' green building literacy.

LITERATURE REVIEW

Efforts to define green building literacy can benefit from work that has been done in the fields of both environmental science and energy in that green building policy is committed to energy saving and environmental conservation. In dealing with environmental literacy, Roth (1992) focused environmental education on four basic issues: (a) the interrelationships between natural and social systems, (b) the unity of humankind with nature, (c) technology and the making of choices, and (d) developmental learning throughout the human life cycle. He defined environmental literacy as the capacity to perceive and interpret the relative health of environmental systems and to take appropriate action to maintain, restore or improve the health of those systems. Environmental literacy

13 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the product's webpage:

www.igi-global.com/article/development-evaluation-instrument-green-building/69397?camid=4v1

This title is available in InfoSci-Journals, InfoSci-Journal Disciplines Communications and Social Science, InfoSci-Technology Adoption, Ethics, and Human Computer Interaction eJournal Collection, InfoSci-Journal Disciplines Computer Science, Security, and Information Technology.

Recommend this product to your librarian:

www.igi-global.com/e-resources/library-recommendation/?id=2

Related Content

Impacts of Behavior Modeling in Online Asynchronous Learning Environments

Charlie C. Chen, Albert L. Harris and Lorne Olfman (2007). *Issues and Trends in Technology and Human Interaction* (pp. 128-151).

www.igi-global.com/chapter/impacts-behavior-modeling-online-asynchronous/24716?camid=4v1a

Chinese POS Disambiguation and Unknown Word Guessing with Lexicalized HMMs

Guohong Fu and Kang-Kwong Luke (2009). *Human Computer Interaction: Concepts, Methodologies, Tools, and Applications* (pp. 1595-1607).

www.igi-global.com/chapter/chinese-pos-disambiguation-unknown-word/22335?camid=4v1a

Explorative Actions in Search for a New Logic of Business Activity

Päivi Ristimäki (2015). *Contemporary Approaches to Activity Theory: Interdisciplinary Perspectives on Human Behavior* (pp. 181-197).

www.igi-global.com/chapter/explorative-actions-in-search-for-a-new-logic-of-business-activity/120826?camid=4v1a

WorldCupinion Experiences with an Android App for Real-Time Opinion Sharing During Soccer World Cup Games

Robert Schleicher, Alireza Sahami Shirazi, Michael Rohs, Sven Kratz and Albrecht Schmidt (2011). *International Journal of Mobile Human Computer Interaction* (pp. 18-35).

www.igi-global.com/article/worldcupinion-experiences-android-app-real/58923?camid=4v1a