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ORIGINAL ARTICLE

Knowledge sharing for sustainable development in civil engineering: a systematic review

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Abstract Sustainable development (SD) knowledge in civil engineering-related disciplines is evolving rapidly. As such, it is increasingly important that engineers share SD knowledge to allow them to systematically enhance the environmental performance of engineered systems. This systematic review identifies published primary data collection studies of SD knowledge sharing (KS) approaches in a civil engineering-related context with the aim of understanding the KS concepts studied, the research strategies used and the key KS findings. A predefined research protocol guided the selection of relevant studies. Analysis revealed that collaboration and education were the major KS concepts and that most studies reside at the positivist end of the research strategy spectrum. Practically all of the identified studies emphasise the need for social interfacing, which enhances the way engineers share complex SD knowledge. The article concludes by describing the practical implications of the research.

Keywords Systematic literature review · Sustainable development · Knowledge sharing · Knowledge management · Civil engineering

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1 Introduction

The aim of sustainable development (SD) is to create an ecological harmony between our planet and the human race. Over the past two decades, there has been increasing awareness of environmental, social and economic unbalance. Knowledge of how to achieve sustainability through the harmonisation of these three components is evolving and increasingly valuable (cf. Gullo and Haygood 2009). Consequently, it is evermore important that we effectively share SD insights and experience; if we do not, it is possible we will fail to innovate and adapt fast enough to systematically enhance the way we interface with our environment.

In response to this challenge, the authors have conducted a systematic review to identify existing studies of knowledge sharing (KS) for SD. Furthermore, as the built environment plays such a major role in SD—controlling the systems in which we live (Shelbourn et al. 2006)—this article focuses solely on studies which exhibit civil engineering aspects. Systematic reviews are unlike traditional literature reviews in that they aim to minimise bias by providing an audit trail of reviewers' decisions, procedures and conclusions (Cook et al. 1997; Petticrew and Roberts 2005). This increases methodological rigour and helps to develop a reliable knowledge base from a range of sources (Tranfield et al. 2003).

In this article, we aim to provide an overview of available KS for SD studies using this systematic review approach, discussing concepts, major findings and research methods employed. This article addresses the following research questions:

1. Which KS concepts have been applied in a SD context?