

## Engineering Education for Sustainable Development in China: Perceptions Bias between Experienced Engineers and Engineering Students

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**Abstract :** Nowadays, sustainable development has increasingly become an important research topic of engineering education. Existing research on Engineering Education for Sustainable Development (EESD) has highlighted the importance of perceptions for ethical responsibility to address sustainable development in practice. However, whether and how the professional engineering experience affects those perceptions has not been proved, especially in a Chinese context. Our study fills this gap by investigating the perceptions bias of EESD between experienced engineers and engineering students. We specifically examined what EESD means for experienced engineers and engineering students using a triple-dimensional model to understand if there are obvious differences between the two groups. Our goal is to make the benefits of these experiences more accessible in school context. The data (n=438) came from a questionnaire created and adapted from previously published studies containing 288 students from mechanical or civil engineering and 150 civil engineers with rich working experience, and the questionnaire was distributed during Fall 2020. T-test was used to find the difference in different dimensions between the two groups. The statistical results show that there is a significant difference in the perceptions of EESD between experienced engineers and inexperienced engineering students in China. Experienced engineers tend to consider sustainable development from ecological, economic, and social perspectives, while engineering students' answers focus more on ecology and ignore economic and social dimensions to some extent. The findings provide empirical evidence that professional experience is helpful to cultivate the cognition and ability of sustainable development in engineering education. The results of this work indicate that more practical content should be added to engineering education to promote sustainable development. In addition, for the design of engineering courses and professional practice systems for sustainable development, we should not only pay attention to the ecological aspects but also emphasize the coordination of ecological, economic, and socially sustainable development (e.g., engineer's ethical responsibility).

**Keywords :** engineering education, sustainable development, experienced engineers, engineering students

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