

## School-Outreach Projects to Children: Lessons for Engineering Education from Questioning Young Minds

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**Abstract :** Under- and post-graduate training can benefit from a more active learning style, and most particularly so in engineering. Despite this, outreach to young children in primary and secondary schools is less-developed in terms of its documented effectiveness, especially given new emphasis placed within the third level and advanced research program's on Education and Public Engagement (EPE). Bearing this in mind, outreach and school visits form the basis to ascertain how active learning, careers stimulus and EPE initiatives for young children can inform the university sector, helping to improve future engineering-teaching standards, and enhancing both quality and practicalities of the teaching-and-learning experience. Indeed, engineering-education EPE/outreach work has been demonstrated to lead to several tangible benefits and improved outcomes, such as greater engagement and interest with science/engineering for school-children, careers awareness, enabling teachers with strong contributions to technical knowledge of engineering subjects, and providing development of general professional skills for engineering, e.g., communication and teamwork. This intervention involved active learning in 'buzz' groups for young children of concepts in gas engineering, observing their peer interactions to develop university-level lessons on activity learning. In addition, at the secondary level, careers-outreach efforts have led to statistical determinations of motivations towards engineering education and training, which aids in the redesign of engineering curricula for more active learning.

**Keywords :** outreach, education and public engagement, careers, peer interactions

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