

## Introducing Transport Engineering through Blended Learning Initiatives

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**Abstract :** Undergraduate students entering university across the last 2 to 3 years tend to be born during the middle years of the 1990s. This generation of students has been exposed to the internet and the desire and dependency on technology since childhood. Brains develop based on environmental influences and technology has wired this generation of student to be attuned to sophisticated complex visual imagery, indicating visual forms of learning may be more effective than the traditional lecture or discussion formats. Furthermore, post-millennials perspectives on career are not focused solely on stability and income but are strongly driven by interest, entrepreneurship and innovation. Accordingly, it is important for educators to acknowledge the generational shift and tailor the delivery of learning material to meet the expectations of the students and the needs of industry. In the context of transport engineering, effectively teaching undergraduate students the basic principles of transport planning, traffic engineering and highway design is fundamental to the progression of the profession from a practice and research perspective. Recent developments in technology have transformed the discipline as practitioners and researchers move away from the traditional “pen and paper” approach to methods involving the use of computer programs and simulation. Further, enhanced accessibility of technology for students has changed the way they understand and learn material being delivered at tertiary education institutions. As a consequence, blended learning approaches, which aim to integrate face to face teaching with flexible self-paced learning resources, have become prevalent to provide scalable education that satisfies the expectations of students. This research study involved the development of a series of ‘Blended Learning’ initiatives implemented within an introductory transport planning and geometric design course, CVEN2401: Sustainable Transport and Highway Engineering, taught at the University of New South Wales, Australia. CVEN2401 was modified by conducting interactive polling exercises during lectures, including weekly online quizzes, offering a series of supplementary learning videos, and implementing a realistic design project that students needed to complete using modelling software that is widely used in practice. These activities and resources were aimed to improve the learning environment for a large class size in excess of 450 students and to ensure that practical industry valued skills were introduced. The case study compared the 2016 and 2017 student cohorts based on their performance across assessment tasks as well as their reception to the material revealed through student feedback surveys. The initiatives were well received with a number of students commenting on the ability to complete self-paced learning and an appreciation of the exposure to a realistic design project. From an educator’s perspective, blending the course made it feasible to interact and engage with students. Personalised learning opportunities were made available whilst delivering a considerable volume of complex content essential for all undergraduate Civil and Environmental Engineering students. Overall, this case study highlights the value of blended learning initiatives, especially in the context of large class size university courses.

**Keywords :** blended learning, highway design, teaching, transport planning

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