



## Embedding Creativity in Structural Engineering Education

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### Abstract

The profession of structural engineering is based on creative thought and actions. This is borne out by the extraordinary projects we see every day, and the enthusiasm of those who deliver them, exactly as we are witnessing at this conference. Given this, it seems clear that the underpinning education for those entering this profession should reflect such creative thought, rather than focus exclusively on the minutiae which we often see in undergraduate curricula. The minutiae are indeed important, but are merely one aspect of engineering education. We must ensure that the big and bold aspects of engineering are centre piece in our education practice, because without the skills to think big and to innovate we have no engineering education – instead, we have a technical education for back roomers. This suits only a tiny fraction of those wanting to be great engineers, so we must do better. Creative endeavours on our degree programmes should be central to reinforce their importance in the profession.

**Keywords:** Creativity; Digital Revolution; Holistic Design, Education.

### 1 Introduction

Every professional engineering institution around the world celebrates engineers in their field whom they believe to be special. They are usually called gold medallists, and they clearly must have done something rather extraordinary in their field. Is their technical ability outstanding? Yes, certainly, but so is that of almost all other chartered engineers. So, their choice to be celebrated as representing the pinnacle of the profession must lie elsewhere. In my opinion, it is the creativity of gold medallists which all institutions revere. Therefore, we see creativity in our profession as the highest possible target to be achieved.

In that case, if creativity is the celebrated heart of our profession, where is creativity as a core element of our undergraduate curricula in civil/structural engineering? Surely it should be central to everything being taught, given its

award-winning importance. But it is often not central at all to the taught experience of countless undergraduate students worldwide. It seems to me that we must change this, and ensure that creativity underpins our education system.

### 2 Why is this important?

Students require deep technical understanding, and in order to ensure that they all achieve such education, it is imperative that they are inspired by their studies. They must be having fun in order to be able to learn deeply. Without such a motivational atmosphere, students need to be taught, which results in shallow easily-forgotten training. Learning and teaching are opposite concepts. Learning is deep, self-driven and long-lasting. Teaching is the anti-dote when self-directed learning has failed.