

E4D Summer School 2016

Sand: an (in)finite resource?

Feedback and evaluation

The summer school is part of the programme “Engineering for Development (E4D) – Science & Technology for the South”, funded by the Sawiris Foundation for Social Development.

Introduction

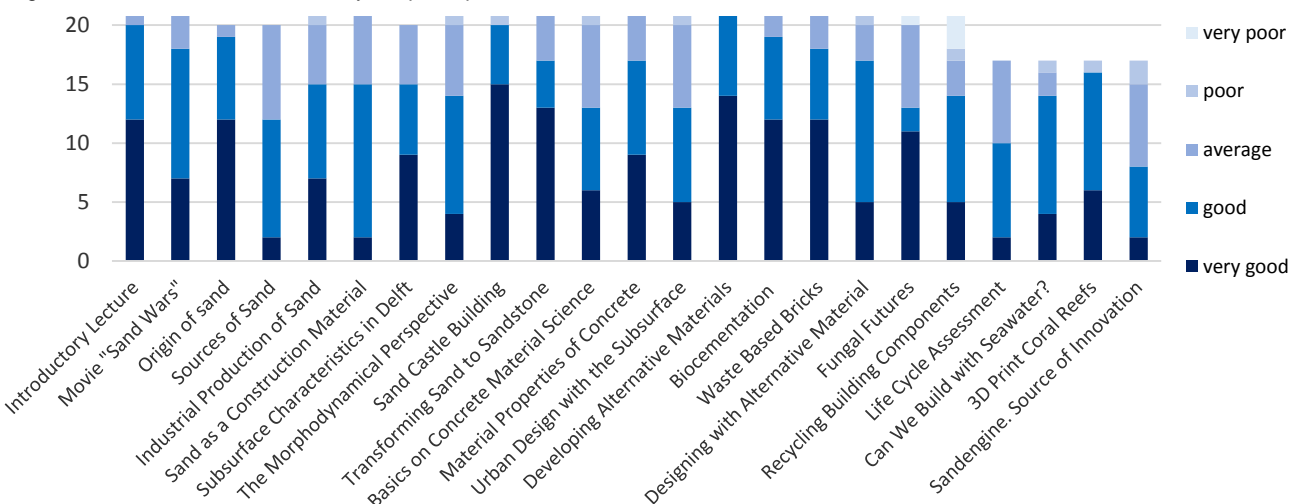
The three-week programme on “Sand: an (in)finite resource?” aimed to develop an integrated vision to a global challenge of today’s construction industry. The programme revolved around the diminishing resource sand and the question of how to find alternative building materials for future cities. The programme took place at Delft University of Technology (TU Delft) in The Netherlands. In total 26 graduate students (ten females) from twelve different countries participated. During the first week, the students were introduced to the topic through a series of input speeches, lectures and symposia. The second and third week focused on workshops along three lines of investigation: bio-cementation, crystallisation, and 3D printing.

Lectures

Experts from academia, research organisations as well as from private companies shared their knowledge with the students. The high profile and interdisciplinary background of the academic lecturers laid the basis to address the challenges of sand as a finite resource. Lecturers came from the University of California Davis (USA), the German Federal Institute of Hydrology (Germany), Swiss Topo (Switzerland), Deltares and UNESCO-IHE (The Netherlands) as well as from the hosting and organising universities, TU Delft and ETH Zürich.

The combination with professionals from the private sector extended the focus of the programme on alternatives and opportunities for the construction

Figure 1. Evaluation of the lectures by the participants

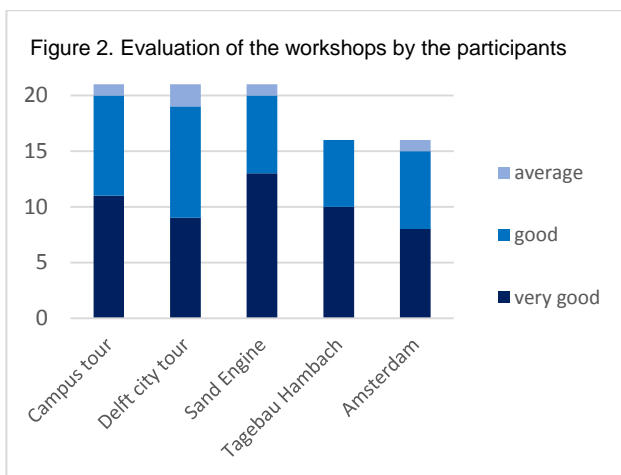


industry. The companies Van Oord and Boskalis represented the Dutch expertise in the global construction business. Stone Cycling, CorpusColi, Rotor and The Salt Project introduced the students to the exciting experience of start-ups.

Most of the students rated the lectures as very good or good as shown in Figure 1.

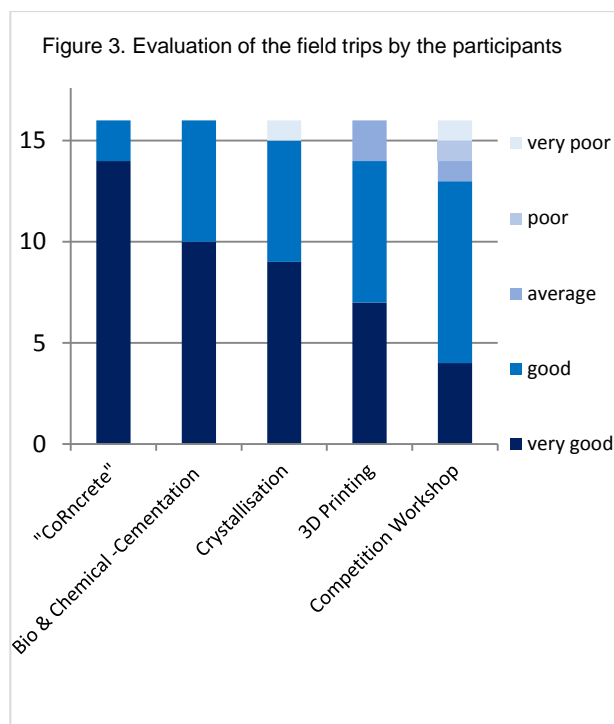
Workshops

The workshops provided students with hands-on opportunities to work in interdisciplinary and intercultural teams and to assess alternative approaches to the building material sand. Participants were highly engaged during the workshops as shown by their evaluation in Figure 2. Solutions with organic materials like maize starch (corn), or bio and chemical cementation of fine sand were taught by TU Delft experts. Two other pioneering methods, crystallisation and 3D printing, were taught by experts from the Ecole Nationale Supérieure d'Architecture Paris-Malaquais (France) and the California College of Arts (USA) respectively. The summer school concluded with a competition workshops led by experts of ETH Zürich, where the participants had to design and test their own alternative construction material.



Field trips

In addition to lectures and workshops the programme included field trips, which the participants greatly enjoyed as shown in Figure 3. As an introduction, they had a campus tour and learnt about the construction of the city of Delft. They explored the Sand Engine (Zandmotor), a novel experiment in coastline protection to diminish the impact of sand dredging and replenishment, and they also visited Maasvlakte, the extension of the port of Rotterdam, one of the largest projects of land reclamation world-wide. During the second week, students had the opportunity to visit the largest lignite mining in Europe, the Tagebau Hambach in Germany, and learn about the treatment of sand, which on this site is considered a waste resource. Finally, in order to prepare the participants for the competition workshop, they had an inspiring field trip to Amsterdam to visit several start-ups focused on various new approaches for the construction sector.



More Information:

→ bit.ly/Sand_2016

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