Training interdisciplinary hydrologists: differences between Chinese and Danish students

Monica Garcia, Claus Davidsen
DTU-Environment, Denmark, mgarc@env.dtu.dk
Pernille Hammar Andersson
DTU-Learning Lab , Denmark, pea@llab.dtu.dk

ABSTRACT

Keywords – hydrology, interdisciplinary teaching, engineering, multicultural environment.

Hydrology has evolved from an applied engineering discipline to an interdisciplinary field. Major advancements are coming from collaboration between hydrologists and scientists with biological, chemical or social science backgrounds to tackle complex problems (Wagener *et al.*, 2007). However, the training of hydrologists with such an interdisciplinary perspective seems to lag behind (Ruddel & Wagener., 2014). The Master program in Water and Environment from the Sino-Danish Center (SDC) attracts every year students with science and engineer backgrounds. Hydrology is a building block for following courses, and in previous years, students with engineering bachelors tended to perform better. Our overall goal was to teach successfully hydrology to all students regardless of background. Specific objectives included: (i) assessing the role of different factors on learning outcomes (e.g. students' background or nationality); and (ii) test a more conceptual based learning approach (Treveler *et al.*, 2008) together with problem-based learning. We analyzed outputs from class surveys (pretest, student satisfaction), assignments and exams of a class of 21 students (14 Chinese, 7 Danish). Surprisingly, our results (Figure 1) showed that the learning outcomes with this set up were more dependent on students' country and teacher than on their engineering/science background. Students from a given nationality learnt significantly better/worse depending on teacher. This highlights how cultural differences affect learning outcomes and the positive effect of having different teachers/teaching styles within a course. Analysis of students' surveys will help to understand better our results to improve future learning outcomes for all hydrology students.

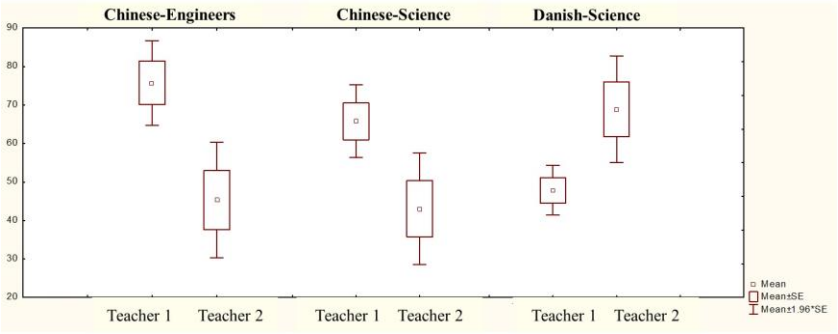

Figure 1: Mean differences and confidence interval ($p<0.05$) in learning outcomes (0-100) for student's nationality and background (Engineer and Science) stratified by teacher. SE is standard error of the mean.
Results from the study will be presented in this contribution as a **poster.**

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