

Women create space –a skills development program to empower female architecture and engineering student

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Architecture and engineering are male dominated professions where women are traditionally considered less capable because of inferior spatial skills and consequently assigned inferior jobs. These assumptions are based on assessment results of programs using drills in representational conventions. (Linn et al., 1985, Uttal et al., 2013). In a study to explore new ways of spatial skills development that may be equally beneficial for male and female students, we used creative 3D modelling tasks in real and virtual space. The standardised Spatial Ability Test by Kárpáti and Gulyás (2002, 2014) was used for the assessment of skill components especially important in design and construction: spatial perception, visualisation and mental manipulation. Visuospatial information processing and problem solving strategies were documented in all phases of planning and modelling in process-folios (Wolfe et al., 2013) and showed an equal number and diversity of creative solutions for men and women. Motivating / inhibiting factors of the design process were revealed through student surveys and proved that open and semi-structured tasks were more encouraging for female students than detailed, traditional planning tasks. Post-test results of the experimental groups were significantly higher ($t[226]=-4,70$, $p<0,001$) and the effect size of the developmental program was substantial: $d=1,07$. Spatial skills development results were unrelated to gender, specialisation, secondary level studies and real or virtual learning environments (Babály and Kárpáti, 2016).

This study proved that an appropriately constructed sets of *creative problem solving tasks and are as effective as traditional, drill-like methods*. Creative modelling is an activity with high motivation value, low inhibition and empowers female students to contribute and develop spatial skills that traditional methods do not adequately foster.



