

Creativity, expertise and the questions people ask in engineering design

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Abstract: Finding a creative solution to a design problem (e.g. designing a device for taking water samples at different depths) often depends on finding a fruitful representation of the problem space. For instance, a problem space in which the device is assumed to be motor-driven might be less fruitful than one in which the mechanism for motion is not specified or could be one of several possibilities. Designers' representations of problem spaces evolve as they work on individual problems. The questions they ask themselves (and sometimes each other) may play a key role in the process. Do expert and novice designers ask similar questions? Do more creative and less creative designers ask similar questions? How do expertise and creativity interact? I present preliminary results from a think-aloud protocol study comparing novices (undergraduate engineering students) and experts (engineers in industry). All participants also took a divergent thinking test to assess creativity.