

## Mobility Challenge: Improve Safety of People Moving Around Campus

### *Beginning Versus Informed Designers*

	Beginning Designers	Informed Designers
<b>Understand the challenge</b>	Treat design task as a well-defined, straightforward problem that they <b>prematurely attempt to solve</b> .	<b>Delay making design decisions</b> in order to explore, comprehend, and frame the problem better.
<b>Build knowledge</b>	<b>Skip research</b> and pose or build solutions immediately.	<b>Do research</b> on the problem and test solutions.
<b>Generate ideas</b>	<b>Work with few or just one ideas</b> , which they can get fixated or stuck on, and may not want to change or discard.	<b>Practice idea fluency</b> in order to work with <b>lots of ideas</b> by doing divergent thinking, brainstorming, etc.
<b>Represent ideas</b>	<b>Propose superficial ideas</b> that do not support deep inquiry of a system and that would not work if built.	<b>Use multiple representations</b> (words, sketches, and prototypes) to explore and investigate design ideas.
<b>Weight options &amp; make decisions</b>	Make design decisions <b>without weighing all options</b> .	<b>Use words and graphics to display and weigh</b> both benefits and tradeoffs of all ideas before picking a design.
<b>Conduct experiments</b>	<b>Do few or no tests</b> on prototypes, or run confounded tests by changing multiple variables in a single experiment.	<b>Conduct valid experiments</b> .
<b>Troubleshoot</b>	<b>Use an unfocused, non-analytical way</b> to view prototypes during testing and troubleshooting of ideas.	<b>Focus attention on problematic areas</b> and subsystems when troubleshooting and proposing ways to fix them.
<b>Revise/iterate</b>	<b>Design in haphazard ways</b> where little learning gets done, or do design steps once in linear order.	<b>Do design in a managed way</b> , where ideas are improved iteratively via feedback, and strategies are used multiple times as needed.
<b>Reflect on process</b>	<b>Do tacit designing with little self-monitoring</b> while working or reflecting on the process and product when done.	<b>Practice reflective thinking</b> by keeping tabs on design strategies and thinking while working and after finished.

#### **Reference:**

Crismond, D., & Adams, R. (2012). The informed design teaching and learning matrix. *Journal of Engineering Education*, 101(4), 738-797