Looking through the lens of expectancy value theory: How training spatial skills affects the student experience

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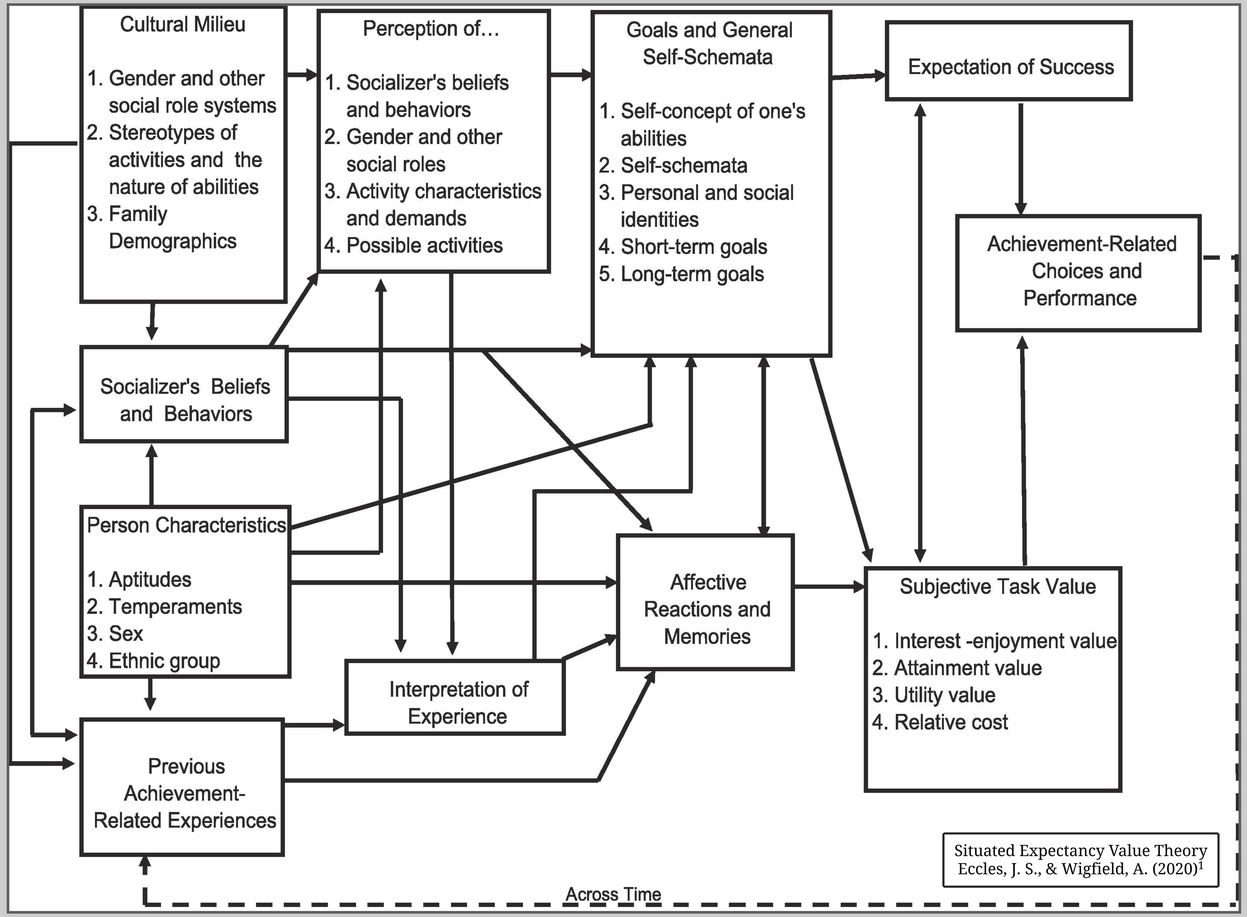
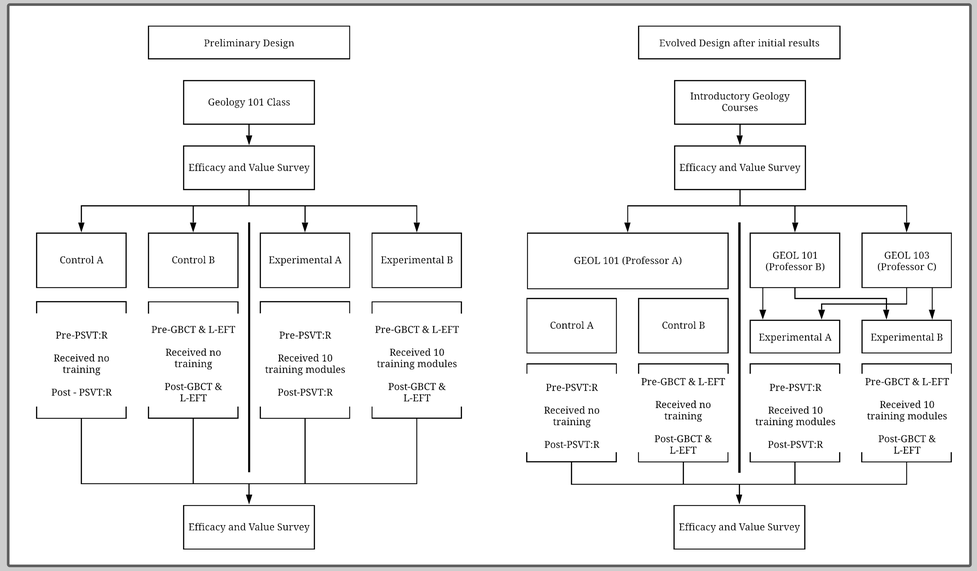


BACKGROUND

In essence, Situated Expectancy Value Theory (SEVT)[1] is a road map that can be used to understand how different factors, such as student interest, can lead to changes in achievement related choices and performance. This study is designed to measure whether or not spatial skills can increase student subjective task value (value) and expectation of success (efficacy), thus resulting in greater achievement related choices (quantified by success in the course). Efficacy and value are measured through five part, Likert scale (0-6) pre- and post-surveys adapted from Glynn et al., (2011)[2] and Hiller & Kitsantas (2016)[3]. The connections between increased spatial skills and success, and persistence in STEM fields is well documented (e.g., citations 4-8); this study seeks to begin understanding the reasons for these observed relationships. To train spatial skills, 10 training modules were adapted from Gold et al. (2018)[9], and growth in spatial skills was assessed using the Geologic Block Cross-Sectioning (GBCT) (Ormand et al., 2014)[10], Revised Purdue Spatial Visualization Tests (PSVT:R) (Yoon, 2011)[11] and the The Leuven Embedded Figures Test (L-EFT) (de-Wit et al., 2017)[12].



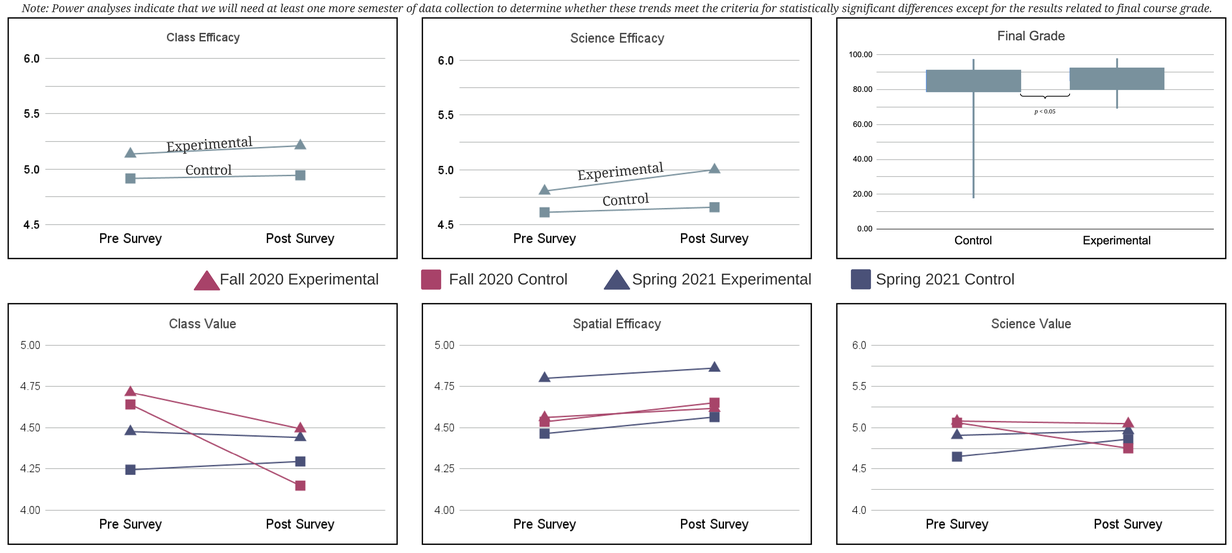
LIMITATIONS & FUTURE POSSIBILITIES

This research design prioritizes measuring how training spatial skills affects efficacy and value, and the relationship those factors have with performance. Similar studies could be done to assess other factors such as Goals & Self Schemata, or Interpretation of Experiences. Explicitly training spatial skills could potentially load on multiple of these factors.

Because this study is focused on measuring the final factors in the SEVT model, it is possible the results found here are due to impacts on factors earlier in the model which still result in measurable gains in efficacy and value. Future work could investigate this by specifically measuring factors that lead into efficacy and value.

RESULTS

Note: Power analyses indicate that we will need at least one more semester of data collection to determine whether these trends meet the criteria for statistically significant differences except for the results related to final course grade.



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