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Title: Data-Driven Change: Designing Your Energy Lifestyle (DYEL)

Abstract: The "Designing Your Energy Lifestyle" (DYEL) prototype program is a five-session workshop series for young adults. The purpose of the program is to use design thinking methods, data from household smart meters and plug loads, and visualizations of household data to engage young people in the co-creation of a personal energy conservation lifestyle. The DYEL program uses methods derived from Stanford d. school and d. life programs to increase self-efficacy to make sustainable changes in their energy consumption lifestyles while satisfying needs of comfort and convenience. DYEL incorporates social science theories for energy related behavior change such as Albert Bandura's social cognitive theory and Elizabeth Shove and others' social practice theory. The program has thus far had two iterations at Ohlone Community College in Northern California. Each 90-minute session includes brief instructional "Energy Lecturettes" introducing key energy data terms related such as load shape, peak energy, baseload energy, and behavior change communication, which are reinforced via weekly interactive online 'Kahoot' quizzes. Students personally engage with the material through accessing their personal PG&E energy use data, learning how to interpret trends and make inferences about behavior, and then using their data to prototype behavior-change interventions to be applied at home. Design thinking tactics are used to structure their energy change solutions, including sticky note brainstorming sessions, storyboarding, wayfinding, problem reframing, iteration, and rapid prototyping. Throughout the course of the program, students keep an energy journal to write prototype ideas, record home energy audits using Kill-a-Watt meters and smart plugs and reflect on the effectiveness of their interventions. The first iteration of DYEL was conducted with a required general earth sciences course with 40 students, while the second was an elective environmental studies course with 15 students. Overall, 89% of students reported understanding their energy data better upon completion of the program, and 53% expressed strong intentions to stay engaged. Prototyping activities were the best-received, while storyboarding activities had the lowest level of perceived effectiveness; homework was also rated poorly during the first iteration and was phased out for the second cohort in favor of more in-class activities. All activities in the second round were rated as "very or extremely effective" by a majority of students, and students overall rated Stanford student instructors as extremely effective. Future research efforts will involve engaging high school students, building a train the trainers program, and collecting smart meter data in addition to self-reports as outcomes.