Development and usage of an alternative methodology for analyzing large quantities of qualitative data for engineering design tasks

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Student responses are transcribed and saved as Word or text files, misspelled words corrected, transcription marks removed, and any symbols changed to words.

Responses are aggregated into groups creating a corpus and opened in TextSTAT. Word frequency is run for each group.

High frequency words are analyzed using "concordance" to identify categories. From categories, themes can be developed or groups of high frequency words can be analyzed for usage and context.

Using selected high frequency words, categories for word usage can be created and coded, followed by a theme development for the data set similar to a constant-comparison qualitative theme development.

Word occurrence used with large numbers of students over time offers insight into how an engineering education affects a student's approach and thinking about engineering problems. In this data set, students in their third year mentioned cost, river dynamics, and wall design details at greater frequencies than they did in their first year. Factors such as the surroundings, people, and effects/affords of the retaining wall were not as important (not mentioned as much) as they were in their first year. Both men and women students in their first year tended to use the word "I" significantly more than they did in their third year. This kind of information can be used to improve engineering curriculum as well as a method for assessing program goals.