Developing the Practices of Expert-Learners

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Problem of Practice

Novice-learners often do not recognize the gaps that exist between their own practices and practices of expert-learners which often lead to academic success (Ertmer & Newby, 1996).

The purpose of my project was to help my students identify strategies that are effective towards their growth from novice learners to expert learners. I examined junior and senior students in an Intermediate Algebra classes in seeking to answer the following research questions:

- **To what extent will students become more expert-like in their classroom practices after being introduced to expert-learner practices?**
- **How do these changes in practices affect their performance in my class?**

Description of Research

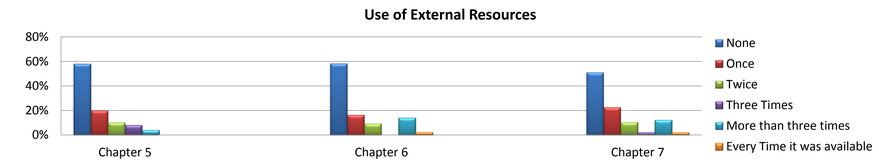
- Through discussion and comparisons between academically successful students and struggling students, my remedial students developed a frequency survey to track their practices and to look for any correlation between their changing practices and their academic success.
- The students participated in a trio of identical assessments placed throughout the time of study to track their ability to demonstrate procedural and conceptual mastery of simplifying rational expressions.

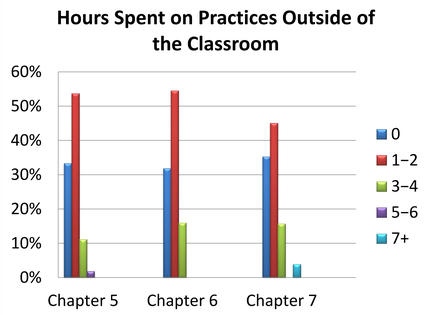
Connection to Industry

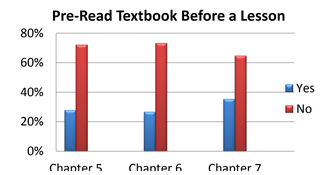
In my industry experiences, working with engineers and technicians provided me with a metaphor of conceptual mastery (a student's ability to recognize the relationships between areas of knowledge, to understand the *why* of a question), procedural mastery (a student's ability to *do* a problem, their ability to follow an algorithm), and the development of expert-learner practices. The teamwork that existed between the engineers and technicians, between the conceptual masters and the procedural masters, demonstrated theses two types of learning that occurs for individual students. As the engineers developed processes through conceptual mastery, and technicians produced the products through procedural mastery, the relationship between engineers and technicians existed through diligence, community relationships, and resourcefulness.

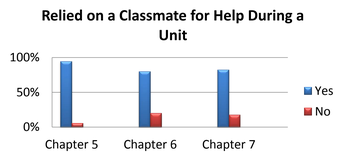
Methods of Data Collection and Results

The following table shows students' responses to the end of chapter 5 survey. The first 3 questions focused on their reliance on external sources, asking them to identify the frequency in which they 1) attended conference period, 2)attended afterschool tutoring, and 3) referenced outside resources (i.e. YouTube, Khan Academy, etc). The second trio of questions focused on the students' time spent on material discussed in class, asking them to identify the number of hours that they 1) spent on homework, 2) spent studying notes, and 3) spent reading the textbook. The students were also asked if they pre-read any sections before they were discussed in class, and if they asked a classmate for help at all during the chapter.

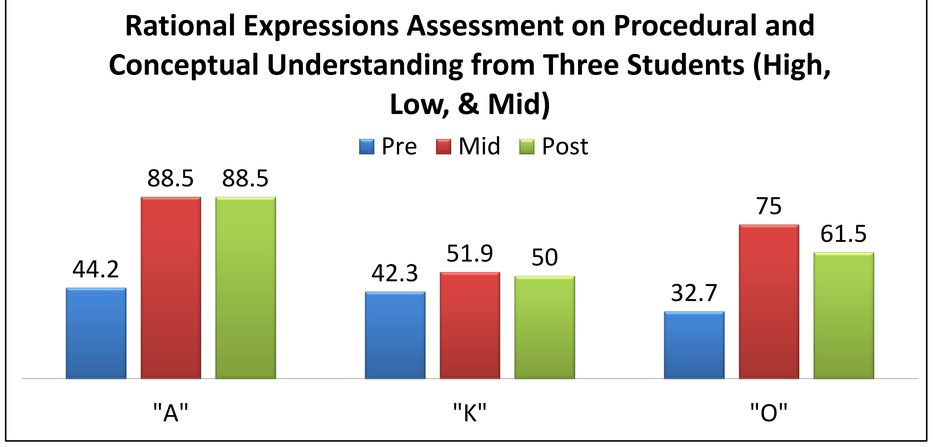








Before I taught my students how to simplify rational expressions, the students were told they would be taking a trio of assessments over this concept. The Pre, Mid, and Post-Assessments would be identical, given at three different times. The Pre would be given before the unit began, the Mid would be given at the end of the unit before the summative assessment, and the Post would be given near the end of the school year. The results of the three assessments are given below:



Findings & Conclusions

Students who were knowledgeable of expert-learner behaviors and practices and who had opportunities to reflect on their own practices in comparison to expert-learners did not themselves develop as expert learners.

- There is still evidence of genuine growth in procedural and conceptual mastery despite the lack of expert-learner practices.
- Any growth in performance, procedural or conceptual, cannot be definitively linked to any gained expert-learner practices.

Implications to Future Teaching

- Interventions used in this study will be implemented at the beginning of the school year, instead of half-way through.
- Interventions will be student designed through their own research of pedagogical theory (rather than discussion), along with my guidance.
- Students will participate in data collection, compilation, and analysis on an individual level and on a community level to provide perspective on the collective relationship between expert-learner practices and individual/class performance.
- Technology will be a focus in regards to data collection, compilation, and analysis. My students will be comfortable with Microsoft Excel and will be introduced to the language of MATLAB.

References

Ertmer, P. A., & Newby, T. J. (1996). The expert learner: Strategic, self-regulated, and reflective. *Instructional science*, *24*(1), 1-24.

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