Developing the Practices of Expert-Learners

Lawrence Schneider, Raytheon Missile Systems, RMS Tucson; Ironwood Ridge High School

High School Mathematics

Introduction

Expert-learners demonstrate practices which lead to conceptual and procedural mastery of content areas. Novice-learners do not participate in these practices consistently, either because they do not have opportunities or they are unaware of the practices of expert-learners altogether.

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. These are just a few practices seen in expert-learners and these are the skills and techniques I aimed to develop in my students.

The purpose of my project was to help my students identify strategies that are effective towards their growth from novice learners to expert learners. My students and I identified practices that led towards academic success, practices that were easy to identify, and practices that novice-learners might not have identified on their own. Examples of easy-to-identify practices include going to afterschool tutoring, attending office hours, and studying with peers. Practices that novice-learners may not think of on their own include reflecting on one's goals and the ways in which those goals are being reached, pre-reading a text before a lesson, looking for opportunities to help others. The students then developed a survey which identified the frequency in which they participated in these kinds of activities and gave them opportunities to reflect on their own experiences.

The students took the surveys at the end of three chapters, identifying their growth/decline in grade, their test scores, and the frequency of expert-learner practices. This data was examined along with the results of a trio of tests across the middle chapter, a Pre-Test, Mid-Test, and Post-Test

Findings & Conclusions

Students who were knowledgeable about 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

I will begin the year of co-creating a frequency survey regarding the practices of expert-learners, and will continue to give my students regular opportunities to reflect on their learning experiences, their goals, and how they are active agents towards their own success and the success of the learning communities inside my classroom. Students will also be given more opportunities to see how their learning practices affect those around them, to help them recognize that learning never occurs in a vacuum. Through this, the students will use current technology to analyze their own responses and analyze the relationships that exist between their actions and their academic success.