Info Sheet: Self-Authorship and Women in SET

Overview of Self-Authorship

Achieving self-authorship requires a developmental journey that is achieved when an individual develops the ability to think complexly and has transitioned from relying on others to relying on self to define one's knowledge, values, and relationships (Kegan, 1994; Baxter Magolda, 2001). Kiaya provides a fictional example of someone who is experiencing this developmental evolution. She knows she has done well in math in science in high school and even though her family and friends encourage her to pick something more traditional, she is really interested in career where she might design medical implants. There is no one in her family who is an engineer, but through some of her after school programs she has met enthusiastic women who enjoy a life with both a career and family. She is someone who deeply values her family, but has learned to trust her own judgment.

Individuals experience developmental transitions through most of their lives, but these are most pronounced in late adolescence through early adulthood. The process of becoming self-authored involves development along three dimensions that refer to how individuals construct ideas about knowledge, their identity, and their relationships. The three dimensions combine to form what Baxter Magolda refers to as a "self-authored system" or frame through which individuals understand the world (Baxter Magolda, 2008, p. 271). The more mature one's development in these three dimensions, the more likely they are to have the skills required to become an effective citizen in a complex society (Baxter Magolda & King, 2004). Self-authored women are likely to be more resilient in the face of the obstacles they encounter when pursuing a career more often held by men. To date, most research about self-authorship involves college students, with some research only now emerging about its role during adolescence (Meszaros, Lee, & Laughlin, 2007; Meszaros & Lane, 2009). Research specifically focused on self-authorship and women in SET fields is limited, but evidence suggests that educators' efforts to promote self-authorship are likely to be instrumental in improving the representation of women in scientific and technical careers.

Research on Self-Authorship

Self-Authorship, Gender, and Race. Research on several diverse groups of college students reveals important insights about ways to support underrepresented groups' interest and persistence in SET and engineering fields. Pizzolato (2003) found that students identified as high-risk displayed self-authoring tendencies at the start of college, and those who were more self-authored were in a better position to deal with marginalizing experiences. Latino/a students that had made progress toward self-authorship were less influenced by the expectations of family and close friends, were better able to understand multiple perspectives, and to offset the effect of negative stereotypes (Torres & Baxter Magolda, 2004; Torres & Hernandez, 2007). Abes and Jones' (2004, 2007) found that self-identified lesbian college students with more advanced meaning making filtered outside influences more effectively and were better able to integrate several identities, even when they seemed to conflict. These findings suggest that there is a benefit to promoting self-authorship in women who want to pursue nontraditional careers because they may be more resilient in the face of a lack of encouragement because they have developed a solid internal foundation.

Self-Authorship and SET

A body of literature is emerging that directly addresses questions about the application of self-authorship to issues related to women's interest, choice, and success in fields in SET. Creamer's (2009, in press) analysis of results from the *Career Decision Making Survey (CDMS)* confirmed a causal link between self-authorship and action, by confirming statistically significant direct links between a measure of each dimension of self-authorship and a number of elements of the process used to reach a decision about a career. More self-authored students were in a better position than those earlier in the developmental continuum to weigh different viewpoints and to make judgments about who is qualified to provide career advice.

Assessment of Self-Authorship

Until recently, most scholars have used qualitative research methods (e.g. interviews) to assess self-authorship. Baxter Magolda and King (2007) described the utility of using a constructivist-developmental approach to interviewing because the interview serves both as a way to assess a student's self-authorship and as an intervention to prompt the student to make meaning by interpreting his/her experiences.

Several scholars have attempted to develop a quantitative instrument to measure this complex construct. Pizzolato (2007) developed a questionnaire (Self-Authorship Survey, or SAS) and an open-ended essay (Experience Survey, or ES) which, when used together, reveal information about a student's self-authoring beliefs and ability to act on them. Another quantitative measure of self-authorship appears in one section of the *CDMS* called "Diverse Viewpoints in Decision Making", which provides a way to test the outcomes of initiatives designed to promote self-authorship (Creamer, 2009, in press).

Recommended Actions for CHANGE

The complexity of the self-authorship can be daunting to educators wishing to implement strategies to promote self-authorship in their classrooms or programs. Baxter Magolda and King (2004) demystified the process by outlining the Learning Partnerships Model (LPM), a model for developing learning partnerships that can promote self-authorship. The LPM suggests three principles to guide the design of activities to promote self-authorship: 1) validate learners as knowers, 2) situate learning in learners' experiences, and 3) mutually construct meaning. These can be achieved through a series of interactions that engage students in shaping the activity, tap into students' prior knowledge and experiences, and alerts them to the role they play in making judgments and constructing knowledge. Baxter Magolda and King (2004) challenged educators to apply these principles and assumptions to create a balance of challenge and support to help promote more complex ways of making meaning.

Conclusions and Recommendations

The following recommendations involving different aspects of self-authorship are for parents, teachers, counselors or advisors, and other professionals who have the potential to make a significant impact on the recruitment, retention, and success of women in SET majors and careers.

1. Have participants collect media depictions of women in various jobs in order to deconstruct occupational stereotypes about sex- and race-appropriate career choices and family roles. Offer opportunities to role play or model different ways to respond to stereotypical statements.

2. Prepare young women to make complex decisions by developing criteria to evaluate the credibility of different sources of career information and to consider what types of people have the credentials and experience to provide accurate information about nontraditional fields.

3. Create after school programs to educate parents, particularly mothers, about career options in SET and to provide them with concrete examples about the roles they can play in promoting informed career decision making.

4. Focus K-12 outreach efforts on students' self-assessment of their skills, abilities, and values and how these mesh with job options in SET fields. Make unfamiliar career choices more comfortable to students by accessing one of many Internet sites that provide biographies and personal profiles of women in scientific and engineering fields.

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