Title: The Intersection of Discipline and Roles: Dr. Pauline Mack's Story as an Instrumental Case Study with Implications for Leadership in Science, Technology, Engineering, and Mathematics

Author: Winnifred Gail Younkin

Dissertation Chair: Dr. Cathy Kaufman

Dissertation Committee Members: Dr. George R. Bieger
Dr. Monte Tidwell

Widespread concerns currently exist regarding our nation's ability to attract, educate, and retain talented, diverse individuals in STEM fields. These concerns are exacerbated by globalized competition and critical economic conditions. With these issues in mind, this instrumental case study was designed to examine the life story of Dr. Pauline Beery Mack in order to inform secondary and tertiary educational leadership in science, technology, engineering, and mathematics (STEM). Dr. Mack's life story was written from the interpretive view and analyzed through a number of theoretical frameworks appropriate to understanding the complexity of an individual in time and place: the psychobiosocial model, constructivism, creativity, perspective of the field, and the capstone framework of leadership. Data for the construction of Dr. Mack's life story were obtained from Pennsylvania State University Archives, The Women's Collection at Texas Woman's University (TWU), original publications, news media archives, and other sources. Interviews conducted for TWU's archives and interviews conducted by the author provided personal insight into Dr. Mack's life and work.

Dr. Mack (1891-1974) lived, learned, created, and taught in a STEM arena that was predominately male. She pursued research with zeal, and was highly adept in attracting jobs, funding, students, and the right people to get the jobs done. Her longitudinal nutrition research, based on a methodology she invented, was innovative in its scope and scale. She

served as an advocate for consumers, the undernourished, women, and minorities. Along the way, she changed perceptions of what women could accomplish. Bone density, school lunches, Victory Gardens, flammability, textile industry scandal, and space travel- Dr. Mack with her insatiable need to know was involved in it all. Her multiplicity of roles and contexts yielded a rich and complex life from which to draw implications for educational leadership in secondary and tertiary STEM fields.

Implications for educational leadership in secondary and tertiary STEM fields that emerged from this study, relating to both affective and academic spheres, range from STEM valuing, discipline-related expertise, divergence value modeling, and expectations. Among the other implications addressed are levels of thinking, scaffolding for attribute development, and working on the work.