Oct 17th, 10:30 AM - 11:45 AM

The Relationship of Mentoring on Middle School Girls’ Science-related Attitudes

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Recommended Citation
https://digitalcommons.georgiasouthern.edu/gera/2014/2014/53
GERA Proposal

The title of this proposal is the relationship of mentoring on middle school girls’ science-related attitudes. The purpose of the quantitative research study was to examine the relationship of mentoring on middle school science-related attitudes between those girls who attended traditional mentoring program or a science-focused mentoring program.

Theories related to this study include social cognitive theory, cognitive development theory and possible selves’ theory. The social cognitive theory was introduced by Albert Bandura in 1977. This theory focuses on the role of observational learning, social experience, and reciprocal determinism in the development of personality (Roeckelein, 2006). Mentoring is a social and learning experience that shapes personality traits for all involved participants. The social cognitive theory explains how many girls prefer experiences that include social interactions, these interactions that may shape career and course choices. Mentoring experiences are primarily based on social experiences where shared interaction is the springboard for learning.

Jean Piaget (2003) established theories for the cognitive development of children. His theory examines the change in human thinking over time. Piaget described four stages of cognitive development from infancy to adulthood (Eggen & Kauchak, 2001; Powell & Kalina, 2009). The period most relevant to the study is the formal operational stage. During this phase children begin to tackle more abstract thoughts; this process begins at age 11. Eggen and Kauchak (2001) stated that this psychological stage proposes that adolescents generate abstract ideas and are also able to apply higher order analysis and reasoning. According to this theory, adolescent girls are considered capable of determining course and career interests.
This quantitative study was gathered through survey research. Survey research examines questions through tendencies and occurrences. (Johnson & Christensen, 2004). Trochim (2006) contended that “survey research is one of the most important areas of measurement; the broad area of survey research encompasses any measurement procedures that involve asking questions of respondents” (para.1). The survey method links the research to ideas, attitudes, and interests taken by a specific group. The specific groups within the study were middle school girls within a science-focused mentoring program and a traditional mentoring program.

The sample consisted of 60 middle-school girls that participated in mentoring programs. The TGI Tech program (science-focused mentoring) and the Girl Scouts group (traditional mentoring), were equally 50.0% of the group. The participants vary in ethnicity and range from ages 11-15.

The between-subject independent variables of this study were science-focused mentoring and traditional mentoring and the dependent variable was the science-related attitudes. This relationship was explored through the use of the TOSRA. The Test of science-related attitudes is an instrument created by Barry Fraser designed to determine seven distinct science-related attitudes. The specific attitudes include social implications of science, attitude to scientific inquiry, adoption of scientific attitudes, enjoyment of science lessons, leisure interest in science, and career interest in science. This study was guided by three research questions:

R1. Is there a difference in middle school science-related attitudes between those girls who attended a science-focused mentoring program and those who attended a traditional mentoring program?
R2: Is there a difference in middle school adoption of scientific attitudes between those girls who attended a science-focused mentoring program and those who attended a traditional mentoring program?

R3: Is there a difference of career interest in science between those girls who attended a science-focused mentoring program and those who attended a traditional mentoring program?

The overall findings, as indicated by the data and results of the research, suggested that there was no significant difference between the science-related attitudes of middle school girls within the science-focused mentoring and those in a traditional mentoring program. The results also indicated no significant difference in the adoption of scientific attitudes and career interest for middle school girls’ within the science-focused mentoring and those in traditional mentoring programs.

Although the research study found no significant difference among the relationship of science-related attitudes and mentoring, standard deviations for all research questions may suggest some correlations within the responses of girls who participated in the science-focused mentoring program. The standard deviations of the science focused mentoring participants were less scattered consistently throughout the survey results.

The practical implications for examining these issues are to further research solutions for improving science-related attitudes of middle school girls. The results of this study have practical implications for the researcher as well as the field of education. Educational researchers should continue to examine the constructs of mentoring as it relates to improving the science-related attitudes of middle school girls. Research has shown that mentoring has a
positive impact on protégés within various fields. Mentoring has also been offered as a solution for improving attitudes. Research suggests that over five million children participate in some type of formal or informal mentoring relationship (Goldner & Mayseless, 2005). The restructuring of mentoring programs to promote underrepresented populations may have a positive impact in STEM fields.

Further research to investigate the relationship of mentoring on middle school girls’ science-related attitudes is necessary in order to advance the understanding of this body of knowledge. The researcher recommends that further studies be completed with larger samples to add to the depth of research. This limited study adds a valuable piece to the understanding of the relationship of mentoring on the science-related attitudes of middle school girls. However, this study was limited to one state, one metropolitan area, and two mentoring programs. Recommendations for future research would include:

1. Replicate the study to include a larger sample. 2. Replicate the study to include pre- and post-surveys at the beginning and end of a year within the mentoring program. 3. Replicate the study that compares the attitudes of girls within mentoring programs to those of girls who are not participating in mentoring programs. 4. Examine science-related attitudes of boys versus girls within science-focused mentoring programs. 5. Replicate the study using specific mentoring practices. An analysis of the quality of mentoring relationships may also offer more depth of insight to the research.