Role models to influence early career choice

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Abstract

The numbers of women in Science, Technology, and Mathematics (STEM) careers have increased in the last two decades, but women are still not equally represented in these areas (Blickenstaff, 2005). One issue is that girls in high school find engineering or technology boring or not attractive for a career (Kekelis, Countryman, Heber & Ancheta, 2006; Thomas, 2004). High school students are not the only ones who not interested in a STEM area. Research shows that children as young as 8 years to 10 years of age are also “turned off” by science and/or mathematics (Abell & Lederman, 2007). Students also lack role models in some STEM areas especially those related to more specific engineering technology careers (Blickenstaff, 2005). Research in science has shown that the use of role models can be very effective in influencing students (Smith & Erb, 1986). This paper will outline existing research about career decision making, role models, and the application to influence K-12 students to choose careers related to Technology areas of STEM.

Introduction

The numbers of women in Science, Technology, and Mathematics (STEM) have increased in the last two decades, but women are still not equally represented in these areas (Blickenstaff 2005). This illustrates the low rate of women who are pursuing STEM especially in technology. There are a number of reasons for the low rate of women in the STEM system. One of the reasons is that girls in high school find engineering boring or not attractive for a career (Kekelis, Countryman, Heber & Ancheta, 2006; Thomas, 2004). High school students are not the only ones who not interested in a science, technology, or mathematics, but also children as young as the age of 8 to 10. These children are also “turned off” by science or mathematics (Abell & Lederman, 2007). Another reason that women are not pursuing STEM is that they cannot look up to anyone as a role model because there is not a specific person that the girls can relate to in engineering (Blickenstaff, 2005). Research has demonstrated strength in role models in many areas, but has not been applied to careers in technology.
Career Choice

Much of the research regarding career-decision-making has focused on predicting a person’s choice by developing a statistical model. Holland’s spatial model (1992), Prediger’s dimensional model (1999), or Gati’s classification model (1986) are examples of this approach. Problems revealed from these theories are related to naturally occurring perceptions of the occupations and how these perceptions develop over a person’s life, if there are negative perceptions the career may not be chosen (Shivy, Rounds, & Jones, 1999). Accordingly, one career study found that students’ attitudes are more closely related to tangible (performance-oriented) rather than symbolic (money) attributes (Hatzios, 1999). These studies have also produced and validated instrumentation and procedures that demonstrated the effectiveness of various models to assess students’ attitudes in a variety of career majors.

Research has shown that many factors determine career choice. Family, peers, education, geographical location, occupational information, demand for jobs, and the difference in age, gender, and personal characteristics all influence career choice (Borg, 1996; Healy, O’Shea, & Crook, 1985; Larson, Butler, Wilson, Nilufer, & Allgood, 1994; Otto & Call, 1985; Splete & Freeman-George, 1985). For many young adults, life after high school is a major turning point in their lives. Their career pathway choices include technical schools, colleges, universities, military, or the workforce.

Family influences on career-decision-making seem very logical as youth may tend to walk “in their parent’s footsteps”. Family role is a significant influence in career choice (Roe, 1956). Her theory suggested that how the family behaves toward the child (warm or cold) is directly related to how a person chooses a career; either person or non-person directed. Careers such as astronomy, engineering, and accounting would be classified as non-person directed careers. In the 1980’s, theories were developed that encouraged counselors to explore the influence of family members in the career and life planning process of students. They also noted that families restricted career exploration by having myths, rules, or boundaries about careers which were not believed to be appropriate for the family. The most influential factor for career choice was certain family attitudes (Reagor & Rehm, 1995). Information available through students’ visits to places of work, work experiences, availability of occupational information, demand for jobs, and the difference in age, gender, and personal characteristics are influences on career choice (Borg, 1996; Healy, O’Shea, & Crook, 1985; Larson, Butler, Wilson, Nilufer, & Allgood, 1994).

Role model research

Studies have shown that cartoon characters have tremendous effects on children, especially through advertising. Studies have been done on how cartoon characters are helpful in influencing children to have preferences toward certain products (Mizerski, 1997). Children are one of the stronger market forces that have been targeted by the beverage and food industries. (Story & French, 2004). One of the reasons that the beverage and food industries are targeting children is that studies have shown that children between the age of two to seven are becoming more attracted to images in advertisements. By allowing the children to be exposed by advertisements with images such as cartoon characters, this can lead to a negative consequence (Mizerski, 1997;
Dagnoli, 1991; Lipman, 1991, Schorow, 1992). One example of a negative consequence is smoking. The tobacco industries are using cartoon characters such as Joe Camel as a way to promote cigarettes to children. Studies that have been done with Camel’s Joe show that children are more likely to recognize the cartoon character than adults (DiFranza, Richards, Paulman, Wolf-Gillespie, Fletcher, Jaffer, & Murray, 1991).

The tobacco industries are not the ones that are using cartoon characters as a way to promote their products. The fast food industries are also using cartoon characters to grab the attention of children. In recent studies, fifty percent of children have stated that food with cartoon character packaging (Shrek) tasted better than food with plain packaging (Klein, 2010). This is concerning since most of the cartoon characters are shown in front of food packages that are not healthy for children. Even though parents may not want to buy the products in the beginning, the children will eventually persuade them to buy the unhealthy products (Klein, 2010). Many studies have been done on cartoon characters and how they influence young children’s perspective on certain products. Although the product may not be healthy, eventually it will reach to the hands of children as young as two years old.

Role models in science careers have been studied to a great extent since 1976 (Fox, Fennema, & Sherman, 1976; Fox, Tobin, & Brody, 1981; Guthrie & Zusman, 1982; Smith & Erb, 1986). Science teachers began to include career awareness as part of the curriculum to assist in building role models that are connected to the content. An example of this would be to have female guest speakers. One program that was developed from these theories was National Science Foundation (NSF) grant from 1984. The COMETS science program developed resources for teachers to integrate role models into a science curriculum (Smith & Erb, 1986).

Role models for Technology

The researchers understand that cartoon characters have an effect on children positively and negatively. What are the characters and role models for Technology? The touchstone energy kids education website for awareness of energy savings introduces a cartoon character CFL Charlie (Compact Fluorescent Light bulb). He has a game to demonstrate the saving of electricity and the overall site aligns with teaching standards for science (http://www.touchstoneenergykids.com, 2010). If you type “Role Models in Technology” into a google search, you find that the United Kingdom has a website dedicated to the Information Technology women, but that is a small sample of technology related careers. Those careers could include: Aviation, Mechanical, Electrical, Industrial, or even Construction areas of the industry as technology careers. In industry, these role models can be used to promote products while gathering interest in the career choice.

Future Research

The belief is that the T is STEM is still missing role models for all ages. The review of literature gives great guidelines for developing an area towards technology careers. There is a need to fill many spots in the technology areas as the baby boomers begin to retire there are large voids that
have been revealed in career areas over the next 5 years. A project supported by industry and academia as partners to use existing individuals or create new characters will be next

References


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