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Felton, Rason V. *Identify Critical Incidents that Influence the Self-Efficacy of African American Women Choosing STEM Careers*

**Abstract**

Research and legislative initiatives in the United States indicate a need to produce more graduates in the field of STEM to meet a global demand. The U.S. Department of Education has launched initiatives to fill this gap through policy, funding, business and academic partnering strategies. African American women are under-represented in the field of STEM. It is critical that government and academic institutions determine how to fill this gap using a group of people that have been notably under-represented in this field.

This study determined the critical incidents that influenced self-efficacy of an African American women to pursue a career in STEM. Uncovering these critical incidents can lead to business and industry filling the gap and meeting a global demand of producing more STEM graduates. The study contributes to the knowledge of this existing problem.

An interview was conducted from a sample at Gateway Technical College in Racine, Wisconsin. The sample was interviewed, and the study uncovered critical incidents that influence the self-efficacy of African American women to pursue a career in STEM. The critical incidents were math self-efficacy, family and academic advising support, and future-self visualization.
Acknowledgments

I would like to take this opportunity and express my sincere gratitude to everyone that supported, encouraged, and guided me through this research experience. At times, I questioned my own ability to complete such an extensive and complex project because of life’s challenges. However, with the support, guidance, and encouragement from my professors, research advisor, and family my own self-efficacy increased.

First, I would like to thank Dr. Schultz my program director for her encouragement. When I encountered adversities, she encouraged and inspired me. I knew at this point that I could complete such an undertaking.

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Lastly, to my husband and children. I couldn’t have been successful without their patience, understanding, and support. Through life and health challenges they supported and encouraged me. With God all things are possible.

This has been an eye-opening experience and this graduate program and research has provided me with insight on how I can contribute to knowledge concerning a phenomenon. Also, it has provided me with insight on how important research is and why it is important to contribute to the existing knowledge of academia. Research can produce awareness and change. I am glad that I was able to experience it.
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Chapter I: Introduction

The workforce has become more diverse in science, technology, engineering, and mathematics (STEM). However, women in STEM career fields are not proportionate to their male counterparts. Women represent 24% of the STEM workforce, but African American women are a population of this percentage that is significantly underrepresented (Noonan, 2017).

Moreover, 11% disparity existed in 2015 for African American women versus white women who were between the ages of 25-34 who graduated with an undergraduate degree and were employed in STEM career (National Center for Education Statistics, 2015). Careers in STEM are significantly important to increase innovation and keep the United States global competitiveness in technology, healthcare, and sustainable development (President's Council of Advisors on Science and Technology, 2010).

As high school graduates decide on a field of study at a post-secondary school, there are factors that can influence their decision to pursue a specific career. Factors such as experience and exposure to certain career fields can shape beliefs about jobs and careers. Research indicates through mentorships and internship experiences that students were motivated and gained confidence when pursuing a specific career field in post-secondary school (Coneal, 2012). These factors pose a question as to whether experience or exposure is a predeterminant to developing confidence in African American women.

Statement of the Problem

The purpose of this study is to determine the relationship between self-efficacy, student experiences, and cultural/ethnic identity. More specifically, this study is designed to answer the following research questions.
1. What experiences have African American women encountered or participated in that influence their self-efficacy towards choosing STEM careers?

2. How does cultural/ethnic identity among African American women influence self-efficacy and choosing careers?

3. What critical incidents influence self-efficacy in African American women to choose a career STEM.

Assumptions

Faculty members such as a career counselor or advisor will be able to identify the students who meet the criteria provided to them by the researcher to obtain the sample. Also, it is assumed that participants will remember and identify the critical incidents that influenced them.

Definition of Terms

These terms will be used throughout this paper. This list represents key terms and their operational definitions.

**African American/Black.** African American or black will be used interchangeably in this paper. A person that self-identifies as African American or black.

**Critical.** Identifying incidents or events that influence or shape behaviors, perceptions, or attitudes (Corbally, 1956).

**Cultural/Ethnic Identity.** Cultural and ethnic identity will be used interchangeably in this paper. It is defined as, “ethnic identity includes self-identification, the importance of ethnicity in one’s life, ethnic group affiliation, positive feelings and attitudes toward one’s ethnic group, and the belief that others view one’s ethnic group favorably” (Psychology, n.d.).

**Experiences.** An experience consists of a mentor, internship, exposure to a specific career by a family member, friend, or educator.
**Self-Efficacy.** A person set of beliefs about their ability to overcome or successfully deal with situations. These set of beliefs include how a person may feel, behave, or think about certain situations and events (Bandura, 1997).

**Under-represented.** A population that is underrepresented in relative to the general population.

**Limitations of the Study**

The limitations of this study include finding participants to conduct the study because the study is limited to a specific population at a technical college. It is not generalizable to other areas.

**Methodology**

The study will require the researcher to interview participants. The study will rely on the qualitative data that is provided during the interview. The data from this interview will be reviewed for themes and address the research questions.
Chapter II: Literature Review

The purpose of this study is to determine the role self-efficacy plays in career choices that African American women make while attending Gateway Technical College in Racine, Wisconsin. This literature review will focus on the under-representation of African American women in STEM careers. More specifically, this discussion will provide information about critical incidents such as cultural identity, student experiences, how these factors relate to self-efficacy, and choosing a career in STEM.

These variables were chosen to determine the relationship of self-efficacy and African American women choosing STEM as a career field. Research presented in this paper will specifically uncover how critical incidents influence the role of self-efficacy and how it relates to career choices in STEM for African American women. Two specific variables are discussed in relationship to its influence on self-efficacy. They are cultural/ethnic identity, and experiences.

African American Women’s representation in STEM has been a discussion cultivating among lawmakers, academic institutions, and STEM advocates (Hill & Rose & American Association of University Women, 2010; U.S. Department of Education, 2016). Moreover, research concerning African American women has focused on factors that influence career interest and choices. Both qualitative and quantitative research is available concerning this topic. However, additional research is needed to identify which critical incidents influence self-efficacy and drive African American women to choose career fields in STEM. The underpinning theory of this study is that self-efficacy can influence career choices or interest.

Self-Efficacy

Prior research has demonstrated an interest concerning self-efficacy and the relationship to career choices in STEM (Lent, Brown & Larkin, 1986). Bandura defines self-efficacy as a
person’s ability to successfully achieve desired outcomes and that people have a set of beliefs including attitudes, perceptions, and behaviors about their own abilities (Bandura, 1997). Specific factors may contribute or influence self-efficacy and impact why people make certain choices in life, such as a career.

Understanding critical incidents among African American women can provide knowledge on how to increase a person’s self-efficacy and how it relates to career choices. Research involving 198 African American women determined a correlation existed between self-efficacy, choice of goal, and vocational interest (Scheuermann, Tokar, & Hall, 2014). Austin’s (2010) study suggested that an African Americans ability to perform well in math and science increased their decision making to pursue a career in engineering. Bandura’s (1997) and Austin’s (2010) theory both suggest that a correlation among self-efficacy and career choice exist. If a person’s ability to do well in a specific subject matter increases their belief and perception about their abilities to perform in a vocation, then further research may provide academia with knowledge concerning how this relates to career choices specifically in STEM.

**Legislative Strategies to Increase Self-Efficacy in STEM**

Legislatures are funding efforts to develop quality curriculum in STEM subjects such as math and science (U.S. Department of Education, n.d.). Lawmakers have determined that in order to meet the global demands of career growth in STEM, they must find methods for increasing participation in STEM careers. As stated previously, if African American women are underrepresented in these career fields, further research is needed to determine how academia can cultivate interest and abilities of self-efficacy in certain subjects such as math and science (Scheuermann, Tokar, & Hall, 2014). This study indicates there is a correlation that exist between self-efficacy and vocational interest. This supports Austin’s (2010) theory concerning
how the confidence levels of African Americans in math and science can produce a career
decision to pursue a STEM field such as engineering. This study has implications that self-
efficacy may be an influencing factor for African American women choosing a specific vocation.
This would explain why lawmakers are focusing on strategies that encourage participation in
STEM subjects. They are promoting efforts to increase participation among underrepresented
groups and early childhood exposure to STEM subjects to develop critical thinking and problem-
solving skills (U.S. Department of Education, n.d.). Lawmakers are creating policies and
allocating funding to states and academic institutions that is designed to peak more student
interest in STEM, while preparing them with the necessary skills to perform well. This strategy
is key when building self-efficacy in math and science according to Austin’s (2010) theory
because this would steer students to pursue fields STEM fields.

Academic self-efficacy has been proven to cultivate an interest in a specific field of study
or career. A study involving non-traditional African American female students measured math
intentions and choice interest (Waller, 2006). The study identified a link existed between self-
efficacy and choice interest. Waller’s study determined math self-efficacy had a significant
correlation to course enrollment and major selection which he defined as career choices. This
would also support Austin’s (2010) theory stated previously in this review. This is an
implication that a person’s ability to successfully perform mathematical tasks with positive
outcomes could increase self-efficacy. This fact suggests that developing specific academic self-
efficacy’s such as math would increase interest that could lead to career choices in STEM.

Additionally, further investigation into intrinsic and extrinsic motivators are factors that
can relate to self-efficacy and the relationship to student success. The researcher explored how
intrinsic and extrinsic motivators link self-efficacy to academic adjustment which is synonymous
with student success (Thomas et al., 2009). This study determined that self-efficacy predicated intrinsic and extrinsic motivation. Moreover, this study concluded that self-efficacy independently can increase student achievement and it was identified as a partial mediator between self-efficacy and student’s success. Intrinsic and extrinsic motivators are important to further study, because it can result in academic institutions identifying methods and programs that can increase persistency among African American female students attending higher education. Research efforts yielded limited information concerning the influence of intrinsic and extrinsic motivators and self-efficacy. Previously stated, Waller’s (2006) study indicates when increased achievement in mathematics occurred, self-efficacy increased which denotes further investigation into critical incidents that lead to increased levels of self-efficacy for academic achievement.

**Cultural/Ethnic Identity**

Historically, women have been under-represented in STEM fields. Moreover, a disparity exists among the number of African American women represented in STEM. According to a ten-year study by the U.S. Department of Education between 2005 and 2010, African American women between the age of 18-24 represented 38% of the population which is 8% less than their white counterparts (National Center for Education Statistics, 2017). Research has suggested that a lack of African American women in STEM fields exist because of cultural barriers such as racism, discrimination, and a lack of inclusion. An experience narrated by two professors at the University of Florida indicated that cultural barriers such as racism still exist among African Americans in the twenty-first century. A group of minority students, that consisted of African Americans and another ethnic group won a robotics competition (Strange, 2017). After the competition, some children of another race who were not part of their team made racist remarks
to the group of minority students. Two of the University of Florida’s professors who had oversight of this competition were not surprised by the racism that the minority students were subjected to. The professors who had been familiar with this type of racism, indicated that this type of racism and words of hate can detour minority students from pursuing STEM careers. One of the professors indicated this type of racism can lead to isolation among minority students. This experience led the professors to believe that students may feel a sense of not belonging to an academic environment involving STEM because of racial biases. The study suggested that these negative experiences could lead students to pursue other fields outside of STEM out of fear of race discrimination if they excel.

Research concerning the role of culture and ethnic identity is an important factor that may help academic institutions understand how these critical incidents detour African American women from seeking higher education and what determinants impact their career choices. An area of study that needs further examination is concerning the cultural and ethnic identity barriers that African American’s face when pursuing higher education and specific career fields. Statistical reporting indicate that African American’s are under-represented in STEM fields. These studies indicate a need to examine how these students feel in an academic climate that is not proportionately represented of their culture.

People who feel a sense of belonging or connectedness to a culture or ethnic group has sparked interest in research about its relationship to self-efficacy. Self-esteem has been linked to having a sense of belongingness and connectedness to one’s own culture or ethnic group (Anglin & Wade, 2007). Thomas & Wagner (2013) like Anglin & Wade (2007), also linked cultural/ethnic identity with self-esteem. Specifically, Thomas & Wagner (2013) conducted a study involving African American subjects. The results of this quantitative study indicated that a
positive correlation existed between ethnic identity and belongingness to one’s group. Basically, a sense of belongingness to one’s ethnic group generated a positive sense of self or self-worth. Ogbu & Davis (2003) suggested that African Americans self-worth increases when they feel a sense of belonging. His research found the need for academia to understand what he refers to as collective identity. Collective identity is the understanding of cultural and language differences in the education of minorities. One of the key elements of student’s feeling a sense of belongingness was based on how they experienced the school’s cultural climate, and if it reflected or represented their culture in the curriculum or language.

Ogbu & Davis (2003) suggested that when African American students didn’t feel a sense of inclusiveness or belongingness, they would oppose the existing culture of the school, become frustrated when attempting to fit in with their white counterparts, or lack the self-worth to pursue certain academics such as honor and advanced placement (AP) courses. Students interviewed and observed in this study sought to integrate their cultural identity and experiences within the school curriculum. For example, he indicated a group of African American theatre arts students were participating in a play and they decided to create their own version of the play that represented their own cultural experience. This type of cultural identity where African Americans form a culture of togetherness or their own peer groups resulted in negative feedback from other race counterparts. They were more inclined to encounter racial discrimination when they assimilated together within their own culture groups. (Brown et al., 2016). These studies suggest that when African American students attempt to assimilate within their own culture and ethnic groups at predominantly white schools, it may increase racial and cultural barriers. Findings suggested that when students attend schools that are predominately white, they may find themselves adopting other cultural norms to feel a sense of belongingness and inclusiveness.
In addition, these studies support theories concerning developing a sense of satisfaction in one’s own ethnic groups as well as others can result in successful college and academic outcomes (Anglin, & Wade, 2007).

These facts denote that ethnic identity plays a role in generating positive self-esteem in both one’s own ethnic group. A sense of satisfaction, positive self-esteem, and belongingness to one culture can produce positive academic outcomes which is linked to Bandura’s (1997) theory about self-efficacy. Bandura defines self-efficacy as a person’s beliefs about their abilities (Bandura, 1997). In this case, prior research leans to the idea that further studies and solutions concerning how academic institutions can promote, develop, and support cultural relationships and diversity among African Americans is important to building self-worth.

African Americans are attempting to find ways to feel inclusive at academic institutes, they will form their own groups to attempt to fit in, but this can be problematic for some students. Anglin & Wade’s (2007) study leads to implications that cultural identity as it relates to self-efficacy is important to understand because African American student’s self-worth increases when they feel the environment is representative of their culture and produces positive academic outcomes. This is a critical component when understanding if African Americans choose career fields in STEM because they feel this is an academic or career field that is representative of their own ethnic identity. This is an area of study that could lead to more knowledge concerning the enrollment and career choices among African American women and determine if their culture and ethnic identity plays a role.

On the other hand, another study focused on academic self-efficacy and its relationship to ethnic identity (Fife & Bond & Byars-Winston, 2011). This study provided information concerning how these factors relate to African American students majoring in STEM career
fields. The statistical data determined no significant correlation between self-efficacy and ethnic identity which is in opposition to Anglin and Wades (2007) theory. This study would implicate that cultural identity doesn’t significantly influence self-efficacy or a person’s choice to major in a STEM career field. The argument that Anglin & Wade versus Fife’s theory leads to implications that additional studies can provide further insight. Specifically, concerning how African American women perceive their ethnic identity in relationship to self-efficacy and making a career choice in STEM.

**Experiences**

Studies have been performed about the role that experiences or mentorships play in constructing self-efficacy and choosing a career in STEM for African American women. The U.S. Department of Education is leading efforts to educate, fund, and provide guidance on how academic institutions can develop and engage students in the field of STEM (U.S. Department of Education, n.d.). The purpose of the initiative is to create exposure and experiences that lead to student interest in fields such as math and science. Lent’s qualitative study involving 23 African American’s who majored in computer science provided an in-depth understanding about experiences that cultivated their choice in a STEM field (Lent et al, 1986). This study indicated that student mentors such as professors, parents, advisors, teachers, and friends were contributors to their decision in STEM. These mentors were identified as working in the computer science field or provided an encouraging support system that cultivated their interest or persistency. Austin’s (2010) study supported the fact that families played a role in cultivating interest in a STEM field. Hanson (2007) supported Austin’s (2010) theory indicating that African American women whose families encouraged and supported them had positive outcomes in science.
Another study indicated fathers of African American girls who had quality relationships had significant levels of academic engagement and a correlation with increased levels of self-esteem (Cooper, 2009). These studies imply a need to further understand the influence of families among African American girls as it relates to building self-esteem, academic ability, and career interest. This could lead to solutions on how government and academic institutions can develop programs, foster communication that help cultivate the relationship between family, students, and academics.

Mondisa (2015) study performed involving ten African American STEM professors who were interviewed, resulted in determining different approaches and practices used to mentor African American students in STEM. This study identified three key approaches that contributed to the success of their mentees. These mentors focused on 1) advising their mentees 2) guiding and helping them identify a plan to reach academic success and 3) developing a relationship of caring with the student. The results of this study indicated that the mentorship strategies used by African American STEM professors helped the students achieve their goal through persistency and increasing their perception about their ability to be academically successful in their field. Additionally, the mentorship strategies in this study defined methods to deal with negative preconceived beliefs about one’s own ability to academically achieve. Negative beliefs about one’s ability to perform academically can impact the self-efficacy of students pursuing career fields in STEM and suggest that African American STEM mentors can influence the belief about one’s ability to participate in STEM.

Further study on implications of mentorship programs for African American women choosing to pursue careers in STEM is important and may identify the lack of mentors who look like them exist in their programs. Self-efficacy is partially based on a person’s belief about their
own abilities according to Bandura (1997) definition of stem. Based on the study performed by Mondisa (2015), if mentorship can increase one’s perception about their academic ability in STEM, it’s a critical element to further investigate critical influences as it relates to self-efficacy.

Attending a Historically Black College and University (HBCU) proves to be an experience that African American students participate in and have cultivated positive outcomes for those majoring in STEM. According to a recent study performed by the National Science Foundation, approximately 30% of the science and engineering undergraduate degree graduates were obtained from an HBCU (National Science Foundation, National Center for Science and Engineering Statistics, 2017). Spelman which is an HBCU has provided contributions to producing African American women in STEM fields (Pema et al., 2009). This research examined strategies that could further increase the attainment of African American women in STEM. This element is important to understand what strategies are being used to matriculate African American women in STEM careers specifically at an HBCU. Determining the experiences of African American women at HBCU’s could help non HBCU colleges develop similar successful strategies. Participants in this study primarily explained their experiences at Spelman as being one that fostered peer relationships, faculty support, alumni mentorship, and positive psychological support concerning student abilities to achieve academic success (Perna et al., 2009). One strategy identified in the study was concerning alumni mentorship. Spelman created an alumni mentorship program where former students who had graduated and were successful, returned to the school to encourage and share their experiences with current students. The program was part of a building confident and self-esteem strategy. When current students can identify with the barriers and challenges that former successful students overcame, it provided them with a perception that they could relate to and achieve their goals. This is key
because according to Bandura’s (1997) theory about self-efficacy; mentoring and building self-esteem is contributing to one’s belief that they can achieve their goal.

Minority student’s academic performance at an Historically Black College and University (HBCU) was measured using a model called Benjamin Banneker Scholars Program (BBSP) and was designed as a mentorship model to increase academic performance among minority students, retention, and graduation rates in STEM (Kendricks, Nedunuri, & Arment, 2013). This fact is important because Waller’s (2006) theory indicates academic self-efficacy in math can lead to an increased interest in math fields. Therefore, applying models with structured mentorship and experiences such as the BBSP can increase academic performance in STEM.

Another study suggested that African American women who participated or experienced college at a Historically Black College and University (HBCU) had a higher rate of participation in STEM majors than at a traditional university (O’Brien et al., 2015). This leads to an argument about the experiences of inclusiveness in predominately white colleges versus black colleges for African American women. One qualitative study interviewed 15 African American women who were majoring or had a career in STEM (Charleston, George, Jackson, Berhanu, & Amechi, 2014). Among the participants, many shared their experiences in a STEM field during their undergraduate and graduate years. Only one student attended an HBCU and the other students were enrolled at a predominately white university. These findings indicate that many of the women who attended a predominately white college felt a sense of isolation. Participants felt that they didn’t have the peer or culture climate to cultivate relationships with other STEM counterparts. African American females in STEM may look to pursue STEM career fields at an HBCU because they view it as being more inclusive and an environment with a curriculum that identifies with their culture. This would support (Perna et al., 2009) research that uncovered
strategies that would help cultivate positive relationships for African American women in STEM at predominately white colleges. These findings implicate a need to further investigate the hypothesis stated earlier in this paper about experiences and its relationship to self-efficacy and career choices in STEM among African American women.

In summary, this literature review has provided prior knowledge and contributions about critical incidents such as culture/ethnic identity and experiences that can influence self-efficacy. Arguments have been made that critical incidents can influence self-efficacy, however, in Fife’s (2011) case it may not be linked to these incidents. Identifying these types of critical incidents can be a key factor in determining how it relates to self-efficacy and the choices among African American women choosing a career in STEM.
Chapter III: Methodology

The purpose of this study is to determine what critical incidents influence self-efficacy in African American women and how it relates to choosing a STEM career. More specifically, this study will generate concepts and beliefs about self-efficacy, ethnic identity, and experiences for African American women.

The research design is qualitative and descriptive. A focus group will be used for this study. A pre-interview survey and focus group interview will be used as the instrumentation.

Subject Selection and Description

The subjects selected includes students from Gateway Technical College in Racine, Wisconsin. This sample will be solicited from a career counselor or program director that can identify women who meet the following criteria at a minimum: a) Age 18 and =<50 and b) ethnicity is African American/black.

The researcher will request from faculty, students represented from non-traditional career programs in STEM. This request will hopefully identify (24) students total and a selection from a variety of programs within the field of STEM. Primary major identified must be in a field of study in STEM to include careers such as: engineering, mathematics, science majors, mechanical design technology, and information technology program.

Also, all participants should identify as being a female and African American/black. Students selected must be enrolled and identified as having declared a STEM major. After the selection has been made, the researcher will send an invitation by email to the participants welcoming them to the study. Students will be asked to participate in a demographics survey discussed in the instrumentation part of this study. In addition, dates will be coordinated with the participant to participate in a focus group on their campus site. Reminders will be sent to the
participants verifying location, date, and time. Pizza and non-alcoholic beverages will be provided as an incentive to the participants.

**Instrumentation**

The variables measured in this paper will consist of a questionnaire to obtain basic demographics of each participant (Appendix A). The first instrument will consist of a demographics survey that will be administered using Qualtrics and the identified participants will complete it. The demographics survey will obtain basic data such as age, race, gender, degree major, and number of years in attendance at current school. The instrument is designed to provide results concerning the commonality or characteristics of participants in the study.

The second instrument is an interview that will be conducted as a focus group with participants. Multiple sessions will be conducted of smaller focus group; eight students per session. An email invitation will be generated to students and they will have the opportunity to choose one of the three dates for the focus group interview. Open-ended questions will be given to each participant (see Appendix B). The researcher will moderate the questions. An independently assigned notetaker will take notes in addition to the moderator. Also, one audio and video recorder will be administered during the interview to ensure accuracy during the transcription process. Appropriate consent and confidentiality statements will be given to the participants in accordance with Institutional Review Board (IRB) practices (see Appendix D).

This instrument was developed using standard focus group methods, principles, and techniques (Breen, n.d.). The questions used on the surveys were generated in relation to the independent and dependent variables stated previously.
**Data Collection Procedures**

The demographics instrumentation results will identify the controlling variables such as gender, race, and age. The focus group interview will provide a method to obtain data that will be collected and analyzed with the following variables: critical incident as the independent variable and self-efficacy as the dependent variable. After proper methods of labeling, coding, and categorization; critical incidents would be identified, and these variables can be measured and identified as a predictor or influence in relation to self-efficacy and career choices among African American women in STEM.

**Data Analysis**

The data collected will be further analyzed using a qualitative coding method. The results will be given in a summarization after proper categorization, themes, and connections have been analyzed. In addition, verbatim quotes will be provided as validity to support the analysis.

**Limitations**

Limitations have been identified for this study. This study is limited to a specific geographical location and conducted for African American women choosing STEM careers. Also, the participants ability to remember critical incidents that influenced their self-efficacy to choose a STEM career. However, the results of this study could lead to further research needed among other populations.
Chapter IV: Results

The purpose of this study is to examine the relationship between self-efficacy, student experiences, and cultural/ethnic identity. Moreover, to uncover critical incidents that influence an African American female’s self-efficacy to choose a STEM career. The results will determine what critical incidents were determined to influence the participants current STEM career choice using qualitative methods.

Demographics

A sample was used from Gateway Technical College in Racine, Wisconsin. Two faculty members who are STEM professors identified students that met the criteria for this research and voluntarily recruited participants (Appendix C). Two traditional students who not enrolled in online classes were identified from the faculty members program. One faculty member stated that one of the participants who met the study criteria recently dropped out of the Information Technology program and therefore could not meet the criteria as a current student majoring in STEM. The other participant was identified as meeting the criteria and voluntarily participated in the study.

The participant was identified by race, gender, age, and STEM major based upon the results received from a Qualtrics administered survey. The participant identified as being African American female, between the ages of 31-35, and majoring in electrical engineering. The participant was interviewed using an online audio tool called Zoom in lieu of the initial methodology because she was the only participant. For this study, the student was assigned a pseudo-name for confidentiality purposes and will be identified as either participant or Student A for this research. This participant was interviewed to uncover their experiences on what critical incidents influenced her self-efficacy and decision to major in a STEM field.
Items Analysis

The following paragraphs state the initial topic, including the variables, and results. The results identify what critical incidents such as cultural identity, student experiences, how these factors relate to self-efficacy, and choosing a career in STEM. The findings that were consistent from the experiences shared by the participants interview were a) family and academic support influenced her decision and ability pursue a STEM career b) math and science self-efficacy, and c) future self-visualization.

Mentors: Family and academic faculty support. Experiences that influenced the participants ability to pursue a career in STEM originated from an advisor in high school. The advisor administered a personality test that identified her strengths in math and science. The participant decided based upon her abilities in math and science that electrical engineering would be a good career and one that she could pursue.

Student A reflected on experiences that peaked her interest in her current field of study.

“Well first when I decided to go back to college, I wasn’t really sure what major that I wanted to study… So, I had went to speak to an advisor and they gave me kind a like a personality survey and it was a series of questions. It kind of picked out what subjects that I’d be good in. So, math and science was a prominent one and I’ve always been good in math and science. So that’s how I chose engineering. Electrical engineering”.

Student A reflected on her experience of feeling intimidated when she first walked into one of her engineering courses. She felt intimidated because it was an all-male course and she was the only African American. This made her feel intimidated because of the lack of race and gender equitability in the class. Student A was asked to share her experiences and what attributes she feels an African American woman would need to be successful in your field of study?
“Confidence. I’m in a class and I’m the only black woman in my class and I’ve never had, at this well not at this point, previously I haven’t had any electrical engineering experience and I come into a glass where a lot of the guys do like HVAC and so their kind of familiar with the whole components and everything. So, it can be intimidating. But confidence and determination is what kept me going. Some days I don’t know what’s really going, but I am determined to so, if I have to stay after class and bother my professor for an extra hour, I’ll do it, so just confidence and determination once your heart is set on doing something you gotta to see it through.”

**Future self-visualization.** Student A indicated that she used future self-visualization to increase her self-efficacy and choose a specific career in STEM. She visualized herself being able to afford a certain lifestyle and this propelled her to choose this specific career field. Student A was asked to reflect and discuss who specifically was a role model or mentor that influenced your decision to pursue your career field.

“I would probably have to say my uncle, he was the first in our family to get a college degree and become a nurse. And during my teen years he was like a father figure to me and he always stressed the importance of education and just hearing my thoughts on wanted I be when I grow up and the type of lifestyle I wanted to live so I would have to say my uncle would probably be my biggest influence in my later years.”

**Math and science self-efficacy.** The participant explained certain factors that influenced her ability and confidence in subjects such as math and science. She identified during her adolescent years that her mother would purchase sci-fi books and computer games to develop and enhance her math and science skills. She practiced these math games until she was able to master it. Additionally, the participant indicated other activities that increased her interest and confidence in math occurred during high school. She participated in a group of math scholars
called, “mathletes”. She received many awards in high school. Student A was asked to reflect on her secondary years and explain what she thought prepared her to pursue this career field?

“That’s funny I was thinking about that this morning. So, my mother never graduated high school…and one of things that she really pushed on my brothers and sister was an education. So, as a kid outside of going to school and doing our school work, we would have activities at home to work on. And I’ve always been a big fan of like horror and sci-fi and all that good stuff. And so, she would buy me goosebumps books but one day I needed some help in my math and she went out and brought me a computer game and it was like a sci-fi mystery game and but to beat the game I had to go through a haunted house. But I had to answer a series of math questions…and so I played the game front and back, but it really sharpened up my math skills and so that’s my earliest memory of having an interest in mathematics.

I asked Student A to reflect on her high school years specifically and she explained,

“I’ve always got good grades in math in high school and I would get awards in school I was a part of the high schools mathletes. I’ve always had a natural love of numbers and math”.

In summary, the results of this study uncovered critical incidents that influenced self-efficacy and an African American’s female’s choice to pursue a STEM career. Math and science self-efficacy influenced the participant to pursue a career in STEM. Math and science exposure during adolescent years increased the ability to perform well and have desired academic success in these subjects during secondary school.

The study uncovered belonginess influenced self-efficacy and persistency in STEM, but not when choosing a career in STEM. The participant expressed feeling intimidated in a class
full of male and non-black students. Based upon this study, her feelings imply that gender and race identity made her question her ability to be successful and isolated. Mentorships such as family members and academic faculty support were influencers to one’s ability to perform well and choose a STEM career. In addition, future self-visualization increased self-efficacy and influenced persistency to remain in STEM.

**Research Questions**

The following research questions were designed to uncover how experiences, cultural and ethnic identity influence the self-efficacy of African American choosing a STEM career. In addition, the research questions involved in this qualitative study uncovered critical incidents that impact the self-efficacy of African American women choosing a career in STEM.

**What experiences have African American women encountered or participated in that influence their self-efficacy towards choosing STEM careers?** This study uncovered that academic advisement influenced the self-efficacy of African American women to choose a career in STEM. The participant interviewed in this study identified that her initial decision to pursue her specific career field was initiated by her academic advisor. Additionally, participation in high school activities that increased math self-efficacy proved to enhance one’s ability to do well in subjects that commonly predicated majoring in a STEM field.

**How does cultural/ethnic identity among African American women influence self-efficacy and choosing careers?** This study lacked the ability to produce or uncover cultural or ethnic identity in relation to self-efficacy and choosing a career. The sample size was not adequate to produce different perceptions and experiences concerning one’s own cultural and ethnic identity as it relates to self-efficacy and choosing a career. However, the sample size studied in this case determined that cultural and ethnic influence were not a factor when
choosing a career. The findings indicated that parental or cultural identity did not influence self-efficacy or the participants choice in a STEM field. However, parental acceptance to major in STEM was influential on self-efficacy once the student chose a career in STEM.

**What critical incidents influence self-efficacy in African American women to choose a career in STEM?** Based upon the exploratory findings, this study uncovered that math and science performance and abilities increased self-efficacy and the choice to pursue a STEM career.

Additionally, academic advising influenced self-efficacy. Academic advising can help students identify their academic strengths that could predicate or influence their choice in STEM.

In summary math and science self-efficacy was a significant factor when choosing a career in STEM. Academic advisement and future self-visualization influenced self-efficacy and the choice to major in a STEM field.
Chapter V: Discussion, Conclusion, Recommendations

This research uncovered critical incidents that impact an African American women’s self-efficacy to choose a STEM career. In addition, this discussion will further identify what is known from previous research about self-efficacy among African American women and choosing a STEM career as it relates to the findings in this study.

Discussion

The primary research question, “What experiences have African American women encountered or participated in that influence their self-efficacy towards choosing STEM careers? Previous research indicates that mentors, parents, and advisors were contributors that influenced career choices in STEM (Lent, Brown, & Larken, 1986). Perna et al. (2009) identified strategies that would increase attainment in STEM and one factor was faculty support. In this case, academic support not only increased attainment, but predicated the choice of an African American female to choose a STEM career. Each of these studies determined that mentorship experiences provided encouragement, support, and cultivated interest and a persistency to remain in the field. Also, this study indicated that academic advising influenced the decision of the participant to pursue a career field in STEM, after determining math and science abilities.

The second question in this research, “How does cultural/ethnic identity among African American women influence self-efficacy and choosing careers?” Prior research indicates that a student’s feeling of not fitting in, racial discrimination, and a sense of not belonging can negatively influence self-efficacy (Strange, 2017). Anglin & Wade, (2007) support the theory that self-esteem is linked to a sense of belongingness to one’s own culture. This uncovered that ethnic identity negatively influenced self-efficacy. It also uncovered that gender identity impacted self-efficacy to persist in a STEM field. In this case, the participant felt intimidated
and not feeling adequate when participating in an all-male class, but because of the student’s will and determination to overcome these barriers she persisted. The exploration of this study proved and supported Strange’s (2017) theory that African American females can feel a sense of not belongingness or fitting in when participating in STEM because of their ethnic identity. This study lacked the ability to determine and compare other beliefs and perceptions about one’s own culture and identify as it relates to self-efficacy to support Anglin & Wades (2007) theory. This was largely due to the small sample size obtained for this study.

Brown et al., (2016) study indicated that when students assimilated in their own culture or groups, they may encounter racial biases or discrimination. This study didn’t uncover any racial discrimination concerning peer groups. However, the participant didn’t reveal any experiences with other counterparts of the opposite race or gender. The student didn’t identify or have any other classmates that she could identify with as being “like her” and therefore sought assistance after class from her instructor.

The third question in this research, “What critical incidents influence self-efficacy in African American women to choose a career STEM?” Previous research indicated that math and science increased self-efficacy to pursue a career field in STEM (Austin, 2010). This study determined that exposure and developing math and science skills influenced self-efficacy to pursue a career choice in STEM. Also, Waller (2006) indicated that self-efficacy is linked to career choice, therefore, it is evident that this study uncovered that math self-efficacy led to the participant to pursue a career field in STEM. This research and Waller’s study implies that building and developing students’ abilities to perform well in math and science can lead to a specific career choice.
Conclusion

In conclusion, exposing adolescents to math and science influences the interest and abilities in these subjects. The ability to perform well in math in science can influence an African American women’s self-efficacy to pursue a career in STEM. Based on this study, math and science programs that develop interest and proficiencies in these subjects can influence the self-efficacy of African American women in these career fields. This is evident based on prior research indicating that math and science performance increased self-efficacy and career choice in STEM (Austin, 2010; Waller 2006).

This study also determined that academic advising experiences were influential when determining self-efficacy in a specific subject such as math and science. Academic advisors used strategies to identify the academic strengths. In this study, academic advisors identified the academic strengths of an African American female which led to her belief that she could participate in a STEM field. These skillsets are in alignment with the U.S. Department of Education and legislative initiatives to create exposure in STEM, as well as develop programs that build interest, and provide high quality education in math and sciences (U.S. Department of Education, n.d.)

A lack of cultural and gender diversity in the areas of STEM for African American women have proven to negatively influence self-efficacy. Previous research indicates that African American women in STEM often experience a feeling of isolation and not belonging (Charleston, George, Jackson, Berhanu, & Amechi, 2014). This research supports this study because a lack of cultural, ethnic, and gender diversity can create a feeling of isolation, not fitting in, and intimidation among African American females.
Future self-visualization was uncovered as a critical incident that influenced self-efficacy and persistence to remain in STEM.

In closing, math self-efficacy, mentorship experiences, gender and diversity influence the ability and perceptions about an African American’s choice to pursue a career in STEM.

Recommendations

The results of this study indicate the importance of building and developing math and science self-efficacy during early childhood years. This could lead to more focus on programs that build math and science during the early childhood school years. This study lacked the sample size needed to produce more evidence concerning this theory. It is beneficial to identify the personal and academic experiences that prepared and influenced African American females to pursue a career in STEM. Further research could contribute to knowledge concerning the math and science placement test scores of African American while in secondary school or post-secondary school. This would help academic institutions determine if low math and science scores are impacting the self-efficacy of African American to pursue a STEM field.

Also, this study uncovered the lack of ethnic and gender diversity in the class. Based on the experience of the participant in this study, she felt intimidated and sense of not belonging when attending class due to her being the only black and female student. This research suggest that this college could benefit from an in-house mentorship program that pairs African American females with a mentor in the field when a program lacks gender and ethnic diversity. Previous research indicated that HBCU’s have positively influenced the self-esteem and persistency among African American females by incorporating programs that provide alumni mentorship, faculty, and peer experiences (Perna et al., 2009). This recommendation is supported by Angline & Wades (2007) theory when linking self-esteem to a sense of belonging. A program that
encourages and provides a culture of belongingness among African Americans in a field they are under-represented may improve their perceptions about their ability to perform well and persist in the field. Additionally, further studies into the online program in STEM would contribute knowledge to determine if more African American females are enrolling in online courses versus traditional courses. This study has limitations because the faculty members who provided the sample had traditional format students.
References


President's Council of Advisors on Science and Technology. (2010). *Prepare and inspire: K-12 education in science, technology, engineering, and math (STEM) for America's future.* Retrieved from https://nsf.gov/attachments/117803/public/2a--Prepare_and_ Inspire--PCAST.pdf


Appendix A: Demographic Questionnaire – Qualtrics

1. Age
   a. 18-25
   b. 26-30
   c. 31-35
   d. 36-40
   e. 41-45
   f. >46

2. Ethnicity (Select one)
   a. African American
   b. Asian
   c. Hispanic/Latino
   d. Native Indian
   e. White

3. Gender
   a. Female
   b. Male

4. Number of Years attending Gateway Technical College
   a. 0-1
   b. 2-3
   c. >4

5. Current Major (Please type in your exact major) Do not include any minor degree programs.
Appendix B: Focus Group/Interview Questions

1. Tell me what peaked your interest in your field of study (major)?

2. Share the expressions or feedback that you received from family members when you told them about your specific course of study/major.

3. What experiences during your secondary school years prepared you to pursue this career field?
   a. For example, what factors made you feel prepared to pursue this specific field of study?

4. What is your perception about how African American women are represented in your career field?

5. Share a story about a role model or mentor that influenced your decision to pursue your career field.
   a. For example, what words of encouragement or advice did they provide to you?

6. From your experience in this career field, what attributes should an African-American woman need to be successful in your field of study?

7. Tell us about the methods or ways that you use to encourage yourself to preserve in this career field?

8. When you have a chance to mentor a young African American girl that demonstrates an interest in your chosen career, what words of advice or encouragement are you likely to offer?

9. As an African American woman working in your future career field, what special contributions would you like to make?
Appendix C: Email Communication

From: Felton, Rason  
Sent: Tuesday, November 27, 2018 1:26 PM  
To: Baldwin Grimes, Mary  
Subject: RE: Conducting research at your college -Thesis

Hello Mary,

I hope you enjoyed the holiday this past week. Thank you once again for your assistance with obtaining the subjects for my study. I am checking in to see if there were any subjects that met the study criteria? If so, are you able to send out the email tomorrow?

Thank you!
Rason

Sent from Mail for Windows 10

From: Baldwin Grimes, Mary <baldwingrimesm@gtc.edu>  
Sent: Monday, November 19, 2018 7:14:13 PM  
To: Felton, Rason  
Subject: Re: Conducting research at your college -Thesis

That should work. I’ll let our admin know.

On Monday, November 19, 2018, Felton, Rason <feltonr3945@my.uwstout.edu> wrote:

Mary,

I would like to have the email sent to students NLT than 28 Nov if possible.

Thank you for your assistance.
Rason

From: Baldwin Grimes, Mary  
Sent: Monday, November 19, 2018 7:07 PM  
To: Felton, Rason  
Subject: Re: Conducting research at your college -Thesis

Rason,
Do you have a timeline? Our department administrative assistant will be working this week on gathering students that match.

By what date will you need to hear back from prospective matches?

Thanks,
Mary

On Monday, November 19, 2018, Felton, Rason <feltonr3945@my.uwstout.edu> wrote:

Hello Mary

Thank you for your assistance. I have generated a sample recruitment email that you can send to the students. Per our previous discussion any student that meets that criteria below affiliated with your campus (traditional/online).

**Subject:** Requesting participants to volunteer for research study conducted by University of Wisconsin Stout graduate student

Dear **Student:**

I am writing to let you know about an opportunity to participate in a research study titled: Identify critical incidents that influence the Self-efficacy of African American women choosing STEM careers.

This study is being conducted by Rason Felton a graduate student completing her thesis at the University of Wisconsin Stout. This study will determine what critical incidents influence self-efficacy in African American women and how it relates to choosing a STEM career.

You were selected for this study because you meet the criteria required to voluntarily participate in the study. The criteria required to voluntarily participate is:
If you are interested in participating in this study, please submit your response indicating that you are volunteering as a participant to: feltonr3945@my.uwstout.edu within five business days. It is strictly volunteer. The research study will require the following participation:

1. Survey: Emailed to the participant requesting basic demographic information. This survey should take approximately five minutes.
2. Focus Group: Attend 1 focus group meeting with the research that should last approximately 1 hour. The location will be on the Gateway Campus. Participants will be provided 3 different time slots to choose from.

This research will not identify your name. You will be given pseudo-names to participate in this research. In addition, you will be given a consent form to sign prior to conducting the research.

Thank you again for considering this research opportunity.

//Signed by Gateway Faculty//
From: Felton, Rason
Sent: Friday, November 16, 2018 9:52:51 AM
To: Baldwingrimesm@gtc.edu
Subject: RE: Conducting research at your college -Thesis

Good morning Mary,

I called you on your work phone. I will try your cell phone this afternoon. Sorry about that.😊

Happy Friday!

Rason

Sent from Mail for Windows 10

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From: Felton, Rason
Sent: Wednesday, November 14, 2018 6:24:24 AM
To: Baldwin Grimes, Mary
Cc: Jill Eide; Klemme, Diane
Subject: RE: Conducting research at your college -Thesis

Hello Mary,

I will try to contact you between 2-3:30pm this week. My phone number is 262.914.2788. I would like to coordinate an option to conduct the focus group on your campus in a private location if possible. It would involve small groups of eight. Otherwise, possibly an interview via phone/zoom video conference if necessary.

Thanks!

Rason
Hello Mary,

I will try to contact you between 2-3:30pm this week. My phone number is 262.914.2788. I would like to coordinate an option to conduct the focus group on your campus in a private location if possible. It would involve small groups of eight. Otherwise, possibly an interview via phone/zoom video conference if necessary.

Thanks!
Rason

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From: Baldwin Grimes, Mary <baldwingrimesm@gtc.edu>
Sent: Wednesday, November 14, 2018 2:40:34 AM
To: Felton, Rason
Cc: Jill Eide; Klemme, Diane
Subject: Re: Conducting research at your college -Thesis

Rason,

Yes, Ray advised us of your study. To be honest, I am not sure that we will find a very large pool of candidates from the IT programs. Hopefully Jill will have a larger pool.

I am available by phone in the afternoons prior to 4 PM throughout the week. You would need to call my cell phone (414-412-4085), but I ask that you let me know what number you will call from ahead of time.

I do have a couple questions right away. Where will the focus groups be conducted? Will the students need to travel somewhere or will the focus groups be conducted via video conferencing?

Let me know when you will be calling.

Mary

On Thu, Nov 8, 2018 at 1:32 PM Felton, Rason <feltonr3945@my.uwstout.edu> wrote:
Dear Ms. Mary Baldwin Grimes and Jill Eide,

I have requested permission to conduct research through your institutions Institutional Review Board (IRB). It was approved on 6 November 2018 (see attachment). Mr. Raymond Koukari, Jr. (Dean School of Manufacturing, Engineering, and Information Technology) provided me with your contact information as my representative for this research.

I am currently a graduate student with the University of Wisconsin Stout and in the process of writing my thesis. The title of my thesis is “Identify critical incidents that influence the Self-efficacy of African American women choosing STEM careers”. I am requesting your assistance to identify the following students who meet the criteria stated. Once they have been identified by your school’s data analyst; I am requesting that they are invited to participate in this study. Please review the criteria for the study below.

Subjects:

▪ Race: African American/Black

▪ Gender: Female

▪ Career program: Students that have declared a STEM major.

▪ Age: 18-50

I have generated an email that you can send to all students who meet these criteria.

This study will consist of a focus group that I intend to conduct at your local college. It will consist of students participating in an online survey using Qualtrics that will be emailed to them prior to the focus group meeting. The focus group meeting will be scheduled in groups of eight. If a student needs to reschedule, he/she can attend another time that has been allotted. The duration of the focus group will be approximately one hour. The first ten minutes will be allotted for students to participate in a light snack consisting of water, soda, and pizza. The remaining fifty minutes will consist of the actual focus group meeting. The researcher will conduct the meeting and present students with prompted questions. This session will be recorded and transcribed, however, student’s names will not be used during the study or on the final report. All students will be required to submit a signed consent form prior to the study, which will be sent to their email and returned to the researcher at the time of their meeting.

I will follow up with a telephone call next week and would be happy to address any follow up questions you might have concerning this study. Please let me know if you have any availability next week.

Thank you!
Dear Jill,

Thank you for your assistance. I have generated a sample recruitment email that you can send to the student.

**Subject:** Requesting participants to volunteer for research study conducted by University of Wisconsin Stout graduate student

Dear Student:

I am writing to let you know about an opportunity to participate in a research study titled: **Identify critical incidents that influence the Self-efficacy of African American women choosing STEM careers.** This study is being conducted by Rason Felton a graduate student completing her thesis at the University of Wisconsin Stout. This study will determine what critical incidents influence self-efficacy in African American women and how it relates to choosing a STEM career.

You were selected for this study because you meet the criteria required to voluntarily participate in the study. The criteria required to voluntarily participate is:

1. Race: African American/Black
2. Gender: Female
3. Age: 18 – 50
4. Major: Science, Technology, Engineering, Math (STEM) field

If you are interested in participating in this study, please submit your response indicating that you are volunteering as a participant to: feltonr3945@my.uwstout.edu within five business days. It is strictly volunteer. The research study will require the following participation:
1. **Survey:** Emailed to the participant requesting basic demographic information. This survey should take approximately five minutes.

2. **Focus Group:** Attend 1 focus group meeting with the research that should last approximately 1 hour. The location will be on the Gateway Campus. Participants will be provided 3 different time slots to choose from.

This research will not identify your name. You will be given pseudo-names to participate in this research. In addition, you will be given a consent form to sign prior to conducting the research.

Thank you again for considering this research opportunity.

//Signed by Gateway Faculty//

Sent from Mail for Windows 10
I have one student that would fit this group. Do you want me to have her contact you directly?

On Thu, Nov 8, 2018 at 1:31 PM Felton, Rason <feltonr3945@my.uwstout.edu> wrote:

Dear Ms. Mary Baldwin Grimes and Jill Eide,

I have requested permission to conduct research through your institutions Institutional Review Board (IRB). It was approved on 6 November 2018 (see attachment). Mr. Raymond Koukari, Jr. (Dean School of Manufacturing, Engineering, and Information Technology) provided me with your contact information as my representative for this research.

I am currently a graduate student with the University of Wisconsin Stout and in the process of writing my thesis. The title of my thesis is “Identify critical incidents that influence the Self-efficacy of African American women choosing STEM careers”. I am requesting your assistance to identify the following students who meet the criteria stated. Once they have been identified by your school’s data analyst; I am requesting that they are invited to participate in this study. Please review the criteria for the study below.

Subjects:

- Race: African American/Black
- Gender: Female
- Career program: Students that have declared a STEM major.
- Age: 18-50

I have generated an email that you can send to all students who meet these criteria.

This study will consist of a focus group that I intend to conduct at your local college. It will consist of students participating in an online survey using Qualtrics that will be emailed to them prior to the focus group meeting. The focus group meeting will be scheduled in groups of eight. If a student needs to reschedule, he/she can attend another time that has been allotted. The duration of the focus group will be approximately one hour. The first ten minutes will be allotted for students to participate in a light snack consisting of water, soda, and pizza. The remaining fifty minutes will consist of the actual focus group meeting. The researcher will conduct the meeting and present students with prompted questions. This session will be recorded and transcribed, however, student’s names will not be used during the study or on
the final report. All students will be required to submit a signed consent form prior to the study, which will be sent to their email and returned to the researcher at the time of their meeting.

I will follow up with a telephone call next week and would be happy to address any follow up questions you might have concerning this study. Please let me know if you have any availability next week.

Thank you!

Rason Felton,
Graduate researcher – University of Wisconsin Stout

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Jill M. Eide, MBA

Electrical Engineering Technology Instructor
Gateway Technical College
integrated Manufacturing & Engineering Technology Center
2320 Renaissance Blvd.
Sturtevant, WI 53177
Office: 262.898.7470

Strengths: Maximizer Relator Learner Responsibility Strategic
Appendix D: IRB Approvals

Date: November 6, 2019
To: Rason Felton
From: Michael Smith, GTC IRB Chair

Study Title: Identify critical incidents that influence the self-efficacy of African American women choosing STEM careers.

IRB Review Type: Exempt
Effective Date: November 6, 2018
Expiration Date: November 5, 2023
IRB Review Action: Approved

Rason Felton,

On behalf of Gateway Technical College's Institutional Review Board (IRB), I would like to inform you of approval of the above referenced study. IRB determined through your abstract and survey instrument that this study, as reviewed, posed no greater than minimal risk. Approval is limited to the methodology described in your initial submission; in accordance with Gateway IRB policy and procedures; and in compliance with federal and state regulations. Your project is exempt under Category# 2 and 3 of the Federal Exempt Guidelines for 5 years. If this study continues beyond the five years, you will be required to submit for renewal prior to the expiration date listed above. We wish you well in your research.

Best,

Michael Smith
Director, Institutional Research; Chair, IRB
October 26, 2018

Rason Felton
Human Resource Training and Development
University of Wisconsin-Stout

RE: Identify Critical Incidents that Influence the Self-efficacy of African American Women Choosing STEM Careers

Dear Rason,

The IRB has determined your project, “Identify Critical Incidents that Influence the Self-efficacy of African American Women Choosing STEM Careers” is Exempt from review by the Institutional Review Board for the Protection of Human Subjects. The project is exempt under Category #2/3 of the Federal Exempt Guidelines. Your project is exempt for 5 years from October 26, 2018. If a renewal is needed, it is to be submitted at least 10 working days prior to the approvals end date. Should you need to make modifications to your protocol, please complete the modification form.

Informed Consent: All UW-Stout faculty, staff, and students conducting human subjects’ research under an approved “exempt” category are still ethically bound to follow the basic ethical principles of the Belmont Report: 1) respect for persons; 2) beneficence; and 3) justice. These three principles are best reflected in the practice of obtaining informed consent from participants.

If you are doing any research in which you are paying human subjects to participate, a specific payment procedure must be followed. Instructions and form for the payment procedure can be found at http://www.uwstout.edu/rs/paymentofhumanresearchsubjects.cfm

If you have questions, please contact the IRB office at 715-232-2691, or buchanane@uwstout.edu, and your question will be directed to the appropriate person. I wish you well in completing your study.

Sincerely,

Elizabeth Buchanan
Interim Director, Office of Research and Sponsored Programs; Human Subjects Protections Administrator,
UW-Stout Institutional Review Board for the Protection of Human Subjects in Research

CC: Klemme