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An Examination of Facilitators and Barriers to Academic Careers for Women in STEM

Jacqulyn M. Cavanaugh
Western Kentucky University, jacqulyn.cavanaugh337@topper.wku.edu

AN EXAMINATION OF FACILITATORS AND BARRIERS TO ACADEMIC CAREERS FOR WOMEN IN STEM

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Elizabeth L. Shoenfelt, Director of Thesis

Reagan D. Brown

Diane M. Lickenbrock

Dean, Graduate School 4/24/17 Date

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Directed by: Elizabeth L. Shoenfelt, Reagan D. Brown, and Diane M. Lickenbrock

Department of Psychological Sciences Western Kentucky University

The purpose of the present study was to investigate the facilitators and barriers to women in STEM through comparison to men and non-STEM faculty members. The Pipeline Model and The Vanish Box model were examined to explain the underrepresentation of women in STEM. The current study, using the established facilitators and barriers to women in STEM by Bolton (2016), examined 12 categories that were identified through existing literature, critical incidents (CIs), and a subject-matter expert (SME).

It was hypothesized that Teaching, Service, Research Funding, Mentoring, Professional Development, Administrative Leadership, Hiring Policies, New Child Leave/FMLA policies, and Promotion and Tenure Policies would be identified as barriers to academic careers in STEM disciplines more often than non-STEM disciplines and by women more often than by men. It was also hypothesized that Fairness of Policy Implementation and Practice, Other Policies, and Research Support other than Funding will be identified as a facilitators to women's academic careers to academic careers in STEM disciplines more often than non-STEM disciplines and by women more often than by men.

Two-hundred and forty-two participants completed a survey via Qualtrics that assessed facilitators and barriers to academic careers. Of those that completed the survey, only 134 were used in the analyses, as identification of sex and STEM status was

essential for inclusion in the study. Results revealed that neither hypothesis was confirmed. Exploratory analyses examining the frequencies 12 categories as well as specific facilitators and barriers were conducted. The implications, limitations, and future directions for research were suggested.

Introduction

The increase of Science, Technology, Mathematics, and Engineering (STEM) professionals is of paramount importance as STEM disciplines lead international competition, innovation, and productivity growth (The National Academy of Sciences, 2007). According to a U.S. Department of Commerce report, the contributions by individuals in STEM disciplines lead to new ideas, new companies, and new industries that drive innovation and competitiveness (Langdon, McKittrick, Beede, Khan, & Doms, 2011). The influx of STEM professionals is especially relevant in the United States, a global leader in international innovation and competition. The President's Council of Advisors on STEM has stated that there will be a need to fill over a million STEM professional positions in the next ten years (Olson & Riordan, 2012). A similar report stated that there are currently 600,000 unfilled STEM-related positions (Morrison, Maciejewski, Giffi, DeRocco, McNelly, & Carrick, 2011). The reports support the assertion that there is both a current and future need for STEM professionals. A solution to the need to produce STEM professionals is to consider increasing and retaining the number of an underrepresented group, specifically women, in the STEM disciplines (Xu, 2008).

Women have been underrepresented in STEM and related disciplines throughout history, as men embody science both in image and number (Riegle-Crumb, & King, 2010). The Leaky Pipeline and Vanish Box models have been proposed to explain the poor representation of women in STEM that exists at multiple points in STEM careers (Maltese & Tai, 2011; Etzkowitz, & Ranga, 2011). The models explain when and why women leave STEM. As women progress through STEM disciplines, they are lost at

certain key points. Because of the progression, we can conclude that facilitators exist to STEM careers, and on the other end of the continuum, the loss of individuals from STEM points to barriers that women face. Bolton (2016) examined 12 factors that pose as either facilitators or barriers for women in STEM. These factors include: Hiring Policies, New Child Leave/FMLA Policies, Promotion and Tenure (P&T) Policies, Other Policies, Fairness of Policy Implementation and Practice, Teaching, Service, Research Funding, Research Support Other Than Funding, Mentoring, Professional Development, and Administrative Leadership. In the proposed study, I investigate each of these factors and conclude whether they are facilitators that aid in decreasing gender disparity or barriers that perpetuate inequality in STEM professionals.

STEM in the United States

The acronym STEM was developed by the National Science Foundation (NSF) to describe the fields of Science, Technology, Engineering, and Mathematics. The label is used to encompass events, programs, practices, and policies that include one or more fields in STEM disciplines. NSF has updated this acronym to provide greater inclusivity. NSF currently defines STEM as the disciplines of chemistry, computer and information technology science, engineering, geosciences, life sciences, mathematical sciences, physics and astronomy, social sciences (anthropology, economics, psychology, and sociology), and STEM education and learning (Gonzalez & Kuenzi, 2012).

An increase of STEM professionals is of great necessity as the STEM fields support international competition, innovation, and productivity growth (The National Academy of Sciences, 2007). The presence of STEM professionals is especially important in the United States as the country is widely considered the world leader in

scientific innovation. Historically in the United States, 17% of bachelor's degree recipients are in STEM disciplines (Kuenzi, Mathews, & Mangan, 2006) and, of the students who enter college pursuing a STEM major, fewer than 40% graduate with a STEM degree (Olson & Riordan, 2012). This lack of persistence in the study of STEM disciplines may have both short and long-term consequences for the United States.

According to a report from the President's Council of Advisors on STEM, economic projections estimate the need of an additional one million STEM graduates over the next 10 years (Olson & Riordan, 2012). The current and future state of STEM supply filling this need is insufficient. In the manufacturing sector alone, there are an estimated 600,000 unfilled STEM-related positions (Morrison et al., 2011). Men have been the prominent gender in STEM disciplines from the time of their inception. It is suggested that groups other than men, that is women, be considered to compensate for the shortage of STEM professionals. Women as a group historically have been vastly underrepresented in STEM disciplines (National Science Foundation, 2015). A proposed solution to meet the current and future need is to close the gender gap by increasing the influx and retention of women in STEM disciplines (Xu, 2008).

Representation of Women in STEM

The underrepresentation of women in STEM professions has been documented in the literature through numerous studies supported with decades of research (e.g., Ceci, Williams, & Barnett, 2009; Knapp, Kelly, Whitmore, Gallego, Grau, & Broyles, 2001; National Science Foundation, 2015). The pattern of findings on women in STEM indicates a gender disparity in all levels of STEM. Men historically have been the prominent group in the STEM fields, both in number and as a representation of the norm

(Riegle-Crumb, & King, 2010). This, in part, has led to many policies and practices that benefit the majority group. In many science disciplines, men at graduation outnumber women. This pattern is particularity salient in the fields of engineering, physics, and computer science as women receive only 20% of bachelor's degrees in these fields (Hill, Corbett, & St Rose, 2010). However, there is a positive outlook on closing the gap; fifty percent of bachelor's degrees are awarded to women and, in some fields like psychology, women are the majority (Ellemers, Heuvel, Gilder, Maass, & Bonvini, 2004). This trend continues past the 4-year degree with the number of women earning doctorate in STEM fields increasing more than seven times from 1973 to 2003 (Bilimoria, Joy, & Liang, 2008). However, difficulties are still present as women in STEM at both the undergraduate and graduate level leave at twice the rate of men (Ellemers et al., 2004).

The disparity between genders is not only present at the degree level but also continues into the professional field. The percentage of men faculty hired is significantly greater than that of women faculty (Nelson & Rogers, 2005). The discrepancy between men and women faculty members not only exists at the hiring level, but also the position that each gender attains once hired. Men account for 62% of full-time STEM faculty and 85% of tenured and tenured track STEM faculty in top research institutions (Commission on Professionals in Science and Technology, 2004). Though women are less well represented, the trend is that women are increasing in representation; in 1993 women made up 14% tenured-track faculty positions; this rose to 23% in 2011 (Ceci, Ginterh, Kahn, & Williams, 2014). Women have historically been in a lower salary range than that of their male counterparts. In academia, the average salary for women faculty members is 80% of the income of male faculty (Knapp, Kelly-Reid, Whitmore, Wu, Huh, Levine, &

Broyles, 2004). The gap between salaries of women and men is decreasing as women are being promoted into higher paying tenure-track positions at a level that was not present in the past (Monroe, Ozyurt, Wrigley, & Alexander, 2008).

The overarching trend on women's representation in STEM disciplines is that women are still underrepresented, but the gap is shrinking. Women have made strides in the past 30 years in STEM disciplines, lessening the disparity with men. Though women are still represented to a lesser extent than men with regard to STEM bachelor's and doctorate degrees, the representation of women in STEM is growing. This trend toward equality is continuing in the workforce. Women continue through academia despite blockages, this suggests that there are facilitators that exist which help close the gap between women and men's representation in STEM. In addition to the facilitators, barriers are present as we continually witness inequality between women and men in STEM disciplines; these barriers are, in a large part, why women leave the field. The Vanish Box Model further supports the notion that barriers are present for women in STEM. A number of models have frameworks in which women in STEM face obstacles or blockages in the pursuit of careers in STEM.

Theoretical Models

There are two models that best explain the underrepresentation of women in STEM; these are The Pipeline Model and The Vanish Box Model. The first model, The Pipeline Model, focuses on the point women leave STEM (Blickenstaff, 2005). The model describes the linear progression of women through secondary school to careers in STEM and examines the points of "leakage." The second model, The Vanish Box Model focuses on why women leave STEM, the point at which they leave, and where they

reappear (Etzkowitz & Ranga, 2011). This model emphasize that women's talents are not lost to STEM, but merely relocated outside of academia.

The Pipeline Model. The most popular model used to describe women's underrepresentation in STEM is called The Pipeline Model. The Pipeline Model is a linear model. It begins at the secondary school level and continues into higher education (Maltese & Tai, 2011). This model uses two components to explain the underrepresentation of women: the first is the flow of women into STEM fields, and the second is the leakage of women out of STEM along the pipeline (Xu, 2008). The first component of the pipeline model is that an enlarged pool or the increased flow of women in doctorate programs will help the disparity of women in STEM fields (Kulis, Sicotte, & Collins, 2002).

The second component, commonly referred to as the "leaky pipeline," explains the attrition of women in STEM. The "leaky pipeline" involves a progression through stages that represent the roles within academia that women go through; at each transition stage women trickle out of the pipeline. There are three "leakage points" along the pipeline where women leave STEM fields (Blickenstaff, 2005). The first leakage point is upon initial matriculation into a higher education institution; at this point, a student who was originally interested in a STEM field chooses a non-STEM major. The second leakage point involves changing to a non-STEM major in a higher education institution; the student at this point switches from studies focused on a STEM field to a major in a non-STEM area. The final leakage point occurs following graduation; at this point a STEM graduate chooses a career in a non-STEM field.

The Vanish Box Model. The Vanish Box Model is growing in popularity among STEM researchers (Etzkowitz, & Ranga, 2011). The model incorporates aspects of The Pipeline Model (i.e., explaining when women leave STEM). In contrast to the linear path of The Pipeline Model, the Vanish Box Model uses a combination of both linear and non-linear trajectories in order to explain the absence of women in STEM. The model proposes that the absence of female scientists employed in academia is due to their transition to science-related professions. This model focuses on the intersection between science and business. It suggests that women in STEM are leaving academia because of blockages that are not present in the business sector (Etzkowitz & Ranga, 2011). The Vanish Box model proposes a more favorable outcome for women in STEM. Instead of women in STEM being lost, they are instead focusing their efforts equally in another sector. The women transfer their scientific intelligence and talent to other areas.

The Vanish Box Model consists of four phases starting with the obstacles that women face and ending with the reappearance of women in non-academic professions. In the first stage of the model, institutional and individual blockages appear for women pursuing STEM in academia. These blockages include inflexible academic format, gendered labor separation, women in the outer circle, peer review and evaluation, gender bias in funding, likelihood of leaving career, and fear of being perceived as highly assertive and confrontational (Etzkowitz, & Ranga, 2011). The second phase is a consequence of the first; in this second phase women leave STEM. In the third phase, new occupations arise through the change in social and economic conditions (Etzkowitz, & Ranga, 2011). The fourth and final phase includes women's reappearance in STEM related business roles after leaving STEM fields in academia (Burton-Brooks, 2000).

Facilitators and Barriers in STEM

The STEM literature identifies many facilitators and barriers to women, supporting the notion that there is not one, but many factors that contribute to the outcome of women in STEM (Blackwell, Snyder, & Mavriplis, 2009). The underlying commonality in STEM literature is that gender interacts with many facilitators and barriers in STEM (Hegedorn, 2001). Bolton (2016) used existing literature, critical incidents (CIs), and a subject-matter expert (SME) to identify 12 categories of barriers and facilitators to women in academic STEM careers: Hiring Policies, New Child Leave/FMLA Policies, Promotion and Tenure (P&T) Policies, Other Policies, Fairness of Policy Implementation and Practice, Teaching, Service, Research Funding, Research Support Other Than Funding, Mentoring, Professional Development, and Administrative Leadership.

The current thesis literature review on barriers to women in STEM will be primarily be focused on literature targeting these identified categories. Some of the aforementioned categories will be considered facilitators, some barriers, and many as both facilitators and barriers. Though all categories will be evaluated by the proposed study, some that carry an overarching theme will be grouped under a common header (e.g., policy) and others will be combined under a single heading as the literature often discusses the categories together (e.g., teaching and service).

Teaching and Service. Women in STEM disciplines often participate more in teaching and service than their male counterparts (Rosser, 2004). Participation in these activities can be a barrier to women in an advancement model that downgrades teaching and service relative to other contributions that are more valued, such as research (Monroe

et al., 2008). This downgrading of teaching and service may lead to women being passed over for P&T because their teaching and service contributions are perceived as less valuable than research. These responsibilities also can be viewed as facilitating when institutions implement policies that ensure extra teaching and service duties do not fall exclusively on women faculty and, in addition, the responsibilities should be equally valued as research in consideration for P&T (Rosser, 2004).

Research Funding. When a non-tenured faculty member is under consideration for P&T, committees weigh many variables. Research, teaching, and service hold the most importance in tenure evaluation, with research given the greatest weight at many universities (Rosser, 2004). For this reason, research funding is essential for success in STEM. According to the Leaky Pipeline Model, a gender-disparity exists in research funding with men receiving grants at higher rates than do women. Research funding can be viewed as a barrier when women are not awarded grants and other funding. Institutions are facilitating women in obtaining funding by offering grant writing seminars to educate women in STEM on the grant writing process and how to improve their chances of receiving funding (Mavriplis et al., 2010).

Mentoring. Men historically have been the prominent group in STEM (Riegle-Crumb, & King, 2010). A lack of female mentors or role models can be viewed as a barrier to women, as a low proportion of women in STEM may send the message that STEM disciplines are not attractive or appropriate for women (Blickenstaff, 2015). It is particularly harmful that their are a lack of female mentors, as professionals have been found to gain the most benefit from mentors of the same sex (Scandura & Williams, 2001). However, when present, role models are strong facilitators for women in STEM.

Ramsey, Betz, and Sekaquaptewa (2013) found that women exposed to female role models in STEM had increased retention in their corresponding discipline. Mentorship brings about many facilitators to a woman's career; these include psychosocial support, knowledge acquisition, professional development, satisfaction, and autonomy (Leck, Orser, & Riding, 2009).

Professional Development. Hill et al. (2010) identified professional development as one of the primary climate predictors of satisfaction for women in STEM. Women who engage in career development workshops have been found to develop confidence and soft skills in the areas of grant writing, securing funding, and negotiating positions and start-up packages (Mavriplis et al., 2010). In addition, May, Derting, Hodder, Momsen, Long and Jardeleza (2011) investigated professional development targeted at lecturing skills and found these workshops beneficial to both men and women as they adopted their learned skills in their classrooms. The aforementioned skills are essential for the success of women in STEM disciplines. Implementing workshops and promoting professional development is often viewed as a facilitator of women in STEM.

Administrative Leadership. Poor administrative leadership was included in the top two reasons reported for faculty turnover intentions for men and women in academia (Hill et al., 2010). The first reason was poor research support (Hill et al., 2010). The solution proposed to increase administrative leadership is similar to that proposed to combat poor research funding. The National Academy of Sciences (2007) investigated the effect of administrative leadership in STEM and recommended that, as part of management efforts, leadership workshops be mandatory for deans, department heads, and others within academia with administrative responsibility. If these workshops are

implemented, the leadership skills learned by the administration will help provide guidance to aid the careers of women in STEM. Stronger leadership for women faculty is related to positive outcomes such as increased mentorship and job satisfaction (Bilimoria, Perry, Liang, Stoller, Higgins, & Taylor, 2006).

Hiring Policies. A gender disparity exists with regard to hiring in academia, with men often benefitting (Bilimoria et al., 2011). Men are hired into faculty positions at a rate significantly higher than that of women (Nelson & Rogers, 2005). Women account for a mere 38% of full-time STEM faculty positions (Commission on Professionals in Science and Technology, 2004). One suggested reason for such a large difference between the hiring of women and men is biased hiring practices that result in men being hired at a higher level than women; this explanation attempts to explain why women occupy only 23% of STEM tenure-track positions (Ceci, Ginterh, Kahn, & Williams, 2014). Because women are hired at an unequal number into university STEM positions, solutions have been proposed to close this gap. The National Academy of Sciences (2007) recommended that universities engage in fair, broad, and aggressive searches when open positions arise to encourage equity in departments. Implementing this practice would greatly benefit women in the hiring process and would allow universities to evaluate a wider pool of candidates from which they may choose the best applicant, whether that person is a woman or a man.

New Child Leave/FMLA Policies. Women continue to grow in representation in all levels of academia (Ceci, Ginterh, Kahn, & Williams, 2014). However, this growth is minimal as women are still vastly underrepresented in the STEM disciplines (Bilimoria et al., 2011). Child-care has historically been viewed as the domain of women (Eccles,

1987). To aid in the continual growth of women in the workplace, parental leave policies have been promoted to assist women in their dual roles (Monroe et al., 2008). The United States Congress passed the Family Medical Leave Act (FMLA) of 1993, which offers 12 weeks of unpaid leave and offers job security to those who take leave to engage in family responsibilities (e.g., childbirth, childrearing, familial responsibilities). FMLA act was the first line of assistance for women in STEM with regard to leave. Unfortunately, many organizations and institutions offer only this base of aid in parental leave. Some institutions have expanded on the act by implementing policies that include paid leave; tenure clock extension; and release from teaching, committee, and other work responsibilities. However, these institutions are in the minority (Schimpf, Mercado Santiago, Hoegh, Banerjee, & Pawley, 2013). Implementation of family leave policies has great facilitating effects on women who wish to have both a career and family.

Promotion and Tenure (P&T) Policies. P&T practices as they have traditionally existed can be categorized as barriers because they more often lead to delayed promotion for women (Xu, 2008). Because STEM disciplines have historically been the domain of men, policies regarding P&T were not designed with responsibilities and biological needs of women in mind. In addition to women suffering delayed promotion, men in tenure track positions are 22% more likely than women to receive a promotion to a tenure position within 14 years of receiving a doctorate (Mason & Goulden, 2002). When policies are absent that combat P&T disadvantage to women in STEM, a large barrier exists. Newly proposed P&T policies decrease the disparity between women and men (Etzkowitz & Ranga, 2011). P&T policies that are viewed as facilitators for women do exist in academia. Institutions now are considering how women and men differ in the

tenure timeline and are implementing policies that allow women to Stop the Tenure Clock (STP) or delay promotional review under certain circumstances (Manchester, Leslie, & Kramer, 2010). STP is most often used during parental leave following the birth of a child. Because the tenure clock often coincides with the biological clock, STP enables women to balance both family and career (Monroe et al., 2008).

Fairness of Policy Implementation and Practice. Policies are extremely important to facilitate the careers of women in STEM and to decrease the barriers they face. Policies involving hiring, new child leave/FMLA, P&T, and other policies are essential to the success of women in STEM. It is important, however, that policies in academia are fairly implemented. Examples of fair implementation might include implementation without bias, with consistency, and free from retaliation for following existing policies Bolton (2016). Implementing policies and practices fairly is primarily viewed as a facilitator, except in the absence of such implementation; the failure to implement policies would act as barriers to women in STEM. Blackwell et al. (2009) suggested making polices more transparent and implementing them in a fair manner would be beneficial to women in STEM.

Other Policies. Women in STEM traditionally have struggled to role-balance as spouses, parents, and academics (Comer & Stites-Doe, 2006). Family friendly policies in academia to aid women in STEM may directly and positively impact their work-life balance. Such policies include partner-hiring policies and childcare for children (Monroe et al., 2008). Facilitators for the spousal-academic role include partner-hiring policies that support dual-careers for women and their spouses (Rosser, 2004).

McNeil and Sher (1999) noted that as women grow in number in academia, the number of dual-career couples is growing as well. In order to facilitate both family and academic roles, partner-hiring policies are extremely beneficial. Some programs have taken partner-hiring roles as far as allowing partners who study in the same area to share a single position (Monroe et al., 2008). Partner-hiring policies enable couples that are both in academia to find jobs in close proximity to one another and enable women in STEM to remain geographically near their families while pursuing their careers. In addition to the spousal-academic role, the dual role of parent and academic are difficult to balance for women in STEM.

Traditionally, child-rearing and childcare have been viewed as the responsibility of women; the absence of an alternative method of care can be viewed as a barrier to women in STEM (Monroe et al., 2008). The number of women getting married and having children in pre-tenure years is significantly lower than for men; this finding perpetuates the stereotype that women cannot have both a family and career (Mason & Goulden, 2002). Childcare access has been noted to counteract the hardship placed on women who wish to have both a family and career; it acts as a major facilitator for women in STEM (Mavriplis et al., 2010).

Research Support Other Than Funding. Often funding is the primary form of support that women in STEM seek to further their careers. However, there are alternative forms of support that universities typically provide to their faculty, among them are sabbaticals. Sabbaticals have been documented to contribute to continued learning, improved employee morale, and creating a more productive workforce (Toomy &

Connor, 1988). Institutions that offer sabbaticals may benefit women in STEM by allowing them the opportunity to receive the aforementioned benefits.

Summary

The current review discusses the importance of STEM disciplines in the United States. This review also touches on the current and future need for an increase in STEM professionals. A proposed solution to the current shortage of professionals in STEM is to increase the number of women in STEM disciplines. The review discussed numerous studies pointing to the underrepresentation of women. The (Leaky) Pipeline Model (Xu, 2008) and the Vanish Box Model (Etzkowitz, & Ranga, 2011) were used to examine the point women are absent from STEM, why they leave, and where they reappear. The general trend identified is that a disparity exists between genders (in favor of men) but the gap is becoming smaller. Using the framework of the models in combination with the state of underrepresentation, the current study will investigate facilitators that aid women in academic positions in STEM and barriers that hinder these women.

The Current Study

The framework of The Pipeline Model (Maltese & Tai, 2011) and The Vanish Box Model (Etzkowitz, & Ranga, 2011) suggests that increasing number of women in STEM disciplines is in part due to facilitators that aid their careers. The same models also explain that women leave STEM as a result of barriers they face in academia. The current study will identify the factors that serve as facilitators and barriers to women's academic STEM careers. Bolton (2016) used existing literature, critical incidents, and a subject matter expert to develop a questionnaire to identify barriers and facilitators to academic careers for women in STEM. There were 12 categories in the questionnaire that could be

identified as either a facilitator or barrier; the categories were as follows: Hiring Policies, New Child Leave/FMLA Policies, Promotion and Tenure (P&T) Policies, Other Policies, Fairness of Policy Implementation and Practice, Teaching, Service, Research Funding, Research Support Other Than Funding, Mentoring, Professional Development, and Administrative Leadership.

Barriers. The literature review identified nine areas that are viewed as barriers to women's academic career's in STEM. These are teaching and service, research funding, mentoring, professional development, administrative leadership, hiring policies, new child leave/FMLA policies, and promotion and tenure policies.

Teaching and service responsibilities often fall more heavily on women than men for academic positions in STEM (Rosser, 2004). In evaluation for P&T, research is valued more heavily than teaching and service (Monroe et al., 2008). As teaching and service can be a disadvantage and additional responsibility on faculty, it is expected that it they will impede faculty careers. Funding for research is also essential for success in STEM disciplines as research publications are one of the primary evaluative criterions for P&T (Rosser, 2004). According to Etzkowitz and Ranga (2011), a gender disparity exists in research funding with men receiving a greater amount of funding.

Historically, men have been viewed as the representative group for academic positions in STEM disciplines (Riegle-Crumb, & King, 2010). The lower number of women in STEM makes it more difficult for academics to attain a mentor (Ramsey et al., 2013). Mentoring brings about positive outcomes including psychosocial support, knowledge acquisition, professional development, satisfaction, and autonomy (Leck,

Orser, & Riding, 2009). Therefore, if mentors exist to a lower extent for women, it may be a barrier for women.

One of the primary predictors of satisfaction of women in STEM is professional development (Hill et al., 2010). Career development workshops that develop confidence and skills in the areas of grant writing, securing funding, and negotiating positions and start-up packages have been beneficial to women (Mavriplis et al., 2010).

The National Academy of Sciences (2007) investigated the effect of administrative leadership in STEM and found that leadership skills learned by the administration will help aid the careers of women in STEM. Administrative leadership benefits women STEM faculty in academia when the proper training takes place, however, often workshops in leadership are not provided (Hill et al., 2011).

Changes to traditional policies have been proposed to level the field for women, unfortunately these changes are often not present in the university setting (Comer & Stites-Doe, 2006). The policies that are hypothesized to be barriers to women's academic careers in STEM include hiring policies, child care/FMLA, and P&T policies. The gender disparity that exists in STEM professions in academia is evident at the hiring stage with men attaining a greater number of academic positions (Bilimoria et al., 2011). Nelson and Rogers (2005) found that men are hired into faculty positions at a rate significantly higher than that of women. Currently, hiring policies work to benefit men in STEM positions in academia. Policies that hinder women in academic do not only include hiring policies, but also new child leave/FMLA. According to Eccles (1987) child-care has historically been viewed under the domain of women's responsibilities. With more women in the workforce, the gender roles are becoming less traditional, but still exist (Kabeer, 2016).

Parental leave policies have begun to be implemented nationally to accommodate the growing presence of women in the workforce. However, many academic institutions provide only the bare minimum required for parental leave.

Parental leave policies have existed to the benefit of men over women like P&T practices as they have traditionally existed often lead to delayed promotion for women (Xu, 2008). Policies surrounding P&T have been designed without the responsibilities and biological needs of women in mind, as academic positions in STEM have historically been the domain of men (Mason & Goulden, 2002). P&T policies as they have traditionally existed have been tailored to the careers of men. From a review of the literature on the nine categories identified by Bolton (2016), the following hypotheses are proposed:

> *Hypothesis 1a*: Teaching, Service, Research Funding, Mentoring, Professional Development, Administrative Leadership, Hiring Policies, New Child Leave/FMLA policies, and Promotion and Tenure Policies will be identified as barriers to academic careers in STEM disciplines more often than non-STEM disciplines.
>
> *Hypothesis 1b*: Teaching, Service, Research Funding, Mentoring, Professional Development, Administrative Leadership, Hiring Policies, New Child Leave/FMLA policies, and Promotion and Tenure Policies will be identified as barriers to academic careers more often by women than by men.

Facilitators. The literature review investigated 12 categories identified by Bolton (2016); of those categories the current study identified three categories, that are

hypothesized to be facilitators to women's academic career's in STEM. The following are the facilitators: Fairness of Policy Implementation and Practice, Other Policies, and Research Support other than Funding.

Policies that are beneficial to women holding academic positions in STEM (e.g., partner hiring and childcare) should be implemented fairly if they are to be effective (Comer & Stites-Doe, 2006). Blackwell et al.(2009) suggested implementing fair policies in a transparent manner would be beneficial to women in STEM. It is not only important to consider the delivery of the policy but the policies themselves. Women who hold positions in STEM disciplines often must balance roles as spouses, parents, and academics (Comer & Stites-Doe, 2006). This trend continues to exist in today's workforce (Bismark, Morris, Thomas, Loh, Phelps, & Dickinson, 2015). For this reason, policies outside of New Child Leave/FMLA and P&T are often beneficial to women if they exist in their academic institution. Family friendly policies include both partner-hiring policies and childcare for children (Monroe et al., 2008). If other beneficial policies exist outside of the traditional Child Leave/FMLA and P&T, then they should benefit women.

In addition to policy support, there are other ways that women may be aided in their academic careers. Toomy and Connor (1988) discussed alternative forms of institutional support outside of research funding. The researchers focused on sabbaticals as sabbaticals have been documented to contribute to continuing learning, to improve employee morale, and to create a more productive workforce. The literature on the three categories identified by Bolton (2016) led to the following hypotheses:

Hypothesis 2a: Fairness of Policy Implementation and Practice, Other Policies, and Research Support other than Funding will be identified as facilitators to women's academic careers to academic careers in STEM disciplines more often than non-STEM disciplines.

Hypothesis 2b: Fairness of Policy Implementation and Practice, Other Policies, and Research Support other than Funding will be identified as facilitators to academic careers more often by women than by men.

Method

Participants

Participants were 242 faculty working in STEM and non-STEM positions at a mid-sized southeastern university. However, 108 of the participants were removed from the analyses because they did not identify their sex or because they held a STEM/non-STEM position, resulting in 134 participants (i.e., 57 men and 77 women). Of these participants, 73% identified as White/Caucasian, 1.5% as Hispanic/Chicano/Latino, 1.5% as Asian, 1.5 % as American Indian/Alaskan/Native/Aleut, and 2.2 % as African American/Black. Fifty-four (40%) of the participants indicated that they held a position in STEM and 80 (60%) indicated that they held a faculty position in a non-STEM field.

Demographic Information. Participants reported their sex, employment status, rank, tenure status, STEM status, race/ethnicity, and international faculty status via survey items (see Appendix A).

Facilitators and Barriers. The questionnaire developed by Bolton (2016) was utilized to identify facilitators and barriers faced by STEM and non-STEM academics (see Appendix A). The questionnaire items were developed based on the existing

literature, Critical Incidents (CIs) provided by faculty, and the suggestions of an SME. The CIs were clustered into 12 categories (see Appendix B). The survey format used neutral CIs as response options for both barriers and facilitators. For each category participants were asked if they had encountered facilitators and barriers. For example, for the Service category, participants were asked "Have you encountered policies and practice related to SERVICE that FACILITATED your career at WKU?" Participants who responded yes were then asked to identify specific facilitators and barriers from within that category. The number of facilitators and barriers in any given category ranged from 7 to 27. Following identification of facilitators or barriers, participants were given an opportunity to rate the strength of each on a four-point scale. For example, for barriers the anchors were: not a barrier, minor barrier, moderate barrier, and major barrier.

Materials and Procedure

The first page of the survey was the Informed Consent Form indication IRB approval of the study (see Appendix A). Survey items assessed participants' demographic information and facilitators and barriers in their academic careers (see Appendix A). The survey was administered through an online platform. Participants were sent an email a link to complete the online survey. The survey contained an informed consent document, questions on demographics, and career facilitators and barriers.

Results

This section first provides the results of ANOVAs used to test Hypotheses 1a, 1b, 2a, and 2b. Exploratory analyses by category are then reported for facilitators and barriers identified by STEM men and STEM women. Finally, findings of exploratory analyses by

specific facilitators and barriers are reported for men, women, STEM, and non-STEM groups.

Hypothesis 1 predicted Teaching, Service, Research Funding, Mentoring, Professional Development, Administrative Leadership, Hiring Policies, New Child Leave/FMLA policies, and Promotion and Tenure Policies would be identified as barriers to academic careers in (1a) STEM more often than non-STEM and (1b) women more often than men. To test Hypothesis 1a and 1b, a 2 (sex: male, female) x 2 (STEM: yes, no) ANOVA was conducted to examine the effect of sex and STEM status on barriers (i.e., the sum of barriers identified). The main effects of sex, $F(1, 85) = .05$, $MSE = 6.60$, $p = .83$, partial $\eta^2 = .001$, and STEM status, $F(1, 85) = .14$, $p = .71$, partial $\eta^2 = .002$, were not significant. The interaction effect also was not significant, $F(1, 85) = .57$, $p = .45$, partial $\eta^2 = .007$.

Hypothesis 2 predicted Fairness of Policy Implementation and Practice, Other Policies, and Research Support other than Funding will be identified as facilitators to women's academic careers to academic careers in (2a) STEM more often than non-STEM and (2b) women more often than men. To test Hypothesis 2a and 2b, a 2 (sex: male, female) x 2 (STEM: yes, no) ANOVA was conducted to examine the effect of sex and STEM status on facilitator frequency (i.e., the sum of facilitators identified). The main effects of sex, $F(1, 88) = 2.06$, $MSE = 1.41$, $p = .16$, partial $\eta^2 = .02$, and STEM status, $F(1, 88) = 3.13$, $p = .081$, partial $\eta^2 = .03$, were not significant. The interaction effect was also not significant, $F(1, 88) = .09$, $p = .77$, partial $\eta^2 = .001$. Frequency analyses for the 12 categories of facilitators and barriers were conducted for male and female faculty in STEM (see Table 1). Frequency analyses were conducted for specific

facilitators and barrier across men, women, STEM, and non-STEM groups (see Tables 2-13).

Exploratory Analyses by Category

Frequency analyses for the 12 categories of facilitators and barriers were generated for only male and female faculty in STEM (see Table 1). Women had the highest rate of identification for 9 of the 12 facilitator categories (Teaching, Service, Research Support Other Than Funding, Research, Funding, Professional Development, Hiring Policies, New Child Leave/FMLA Policies, Other Policies, and Mentoring). The largest difference in percentage identified between men and women was for the category "Hiring Policies." A chi-squared test of independence found women identified "Hiring Policies" as a facilitator significantly more than did men, X^2 (1, N = 38) = 3.946, $p < .05$.

The following differences were not significant, but are discussed for descriptive purposes. The difference for male and female STEM faculty in identified facilitators for "New Child Leave/FMLA Policies" was not significant, X^2 (1, N = 92) = 3.578, $p = .59$. Men had a higher rate of identification for 2 of the 12 facilitator categories (Promotion and Tenure (P&T) Policies, Fairness of Policy Implementation and Practice, and Administrative Leadership/Vision).

Although not significantly different, women had the highest rate of identification for 3 of the 12 barrier categories (Teaching, Research Funding, and New Child Leave/FMLA Policies); men had the highest rate of identification for 9 of the 12 barrier categories (Service, Research Support Other Than Funding, Professional Development, Promotion and Tenure (P&T) Policies, Hiring Policies, Other Policies, Fairness of Policy Implementation and Practice, Administrative Leadership/Vision, and Mentoring).

Exploratory Analyses for Specific Facilitators and Barriers within Categories

The survey used in the current study contained specific responses that faculty members could identify as either a facilitator or barrier. Frequencies analyses for each facilitator and barrier within the 12 categories were conducted (see Appendix C). Differences between men and women and between STEM and non-STEM are described. Numbers in parentheses represent the percentage of individuals who identified a specific facilitator or barrier.

Faculty were provided with 11 response options to identify as possible facilitators for "Teaching," (see Table 2). "Opportunity to teach elective course(s) specific to area of expertise" (27.5 – 33.3%) and "Reduced teaching load for new faculty" (19.5 – 22.8%) were identified most frequently by faculty as facilitators to teaching across sexes and STEM/non-STEM groups. "Teaching an uncompensated workload" (13 – 20%) and "Time requirements of admin duties" (16.7 – 20.0%) were identified most frequently by faculty as barriers to teaching across sexes and STEM/non-STEM groups. "Time requirements of teaching load" was identified as a barrier by women (31.2%) and non-STEM faculty (30.0%) at a greater rate than by men (19.3%) and faculty in STEM (20.4%). However, chi-squared tests of independence indicated there was not a significant difference between men and women, X^2 (1, N = 134) = 2.392, p = .12, nor between STEM and non-STEM faculty, X^2 (1, N = 134) = 1.549, p = .21, for the barrier "Time requirements of teaching load."

The following differences were not significant, but are discussed for descriptive purposes. The "Service" category contained seven potential facilitators and barriers, (see Table 3). The most frequently identified response by faculty across sex and STEM status

as a facilitator was “Flexibility in department allowing for service role opportunities” (22.2 – 30.0%); the most frequently identified barrier was “Equitable distribution of service requirements” (13.0 – 17.5%). “Reduced service responsibilities for new faculty” was identified as a facilitator by women (14.3%) and STEM faculty (16.7%) at a greater rate than by men (8.8%) and non-STEM faculty (8.8%). However, chi-squared tests of independence indicated this result was not significantly different between men and women, X^2 (1, N = 134) = .947, p = .33, nor between STEM and non-STEM faculty, X^2 (1, N = 134) = 1.922, p = .16, for the facilitator “Reduced service responsibilities for new faculty.”

Faculty were provided with 20 potential facilitators and barriers in the category “Research Support other than Funding,” (see Table 4). The response “Course load that enables research” was identified most frequently as a facilitator by men (15.8%) and STEM faculty (20.4%), but had much lower rates of identification by women (5.2%) and non-STEM faculty (2.5%). Chi-squared tests of independence indicated men identified the facilitator significantly more than did women, X^2 (1, N = 134) = 4.197, p < .05. In addition, STEM faculty identified the response significantly more than did non-STEM faculty, X^2 (1, N = 134) = 11.752, p < .01. Also, “Course load that enables research” was the most frequently identified barrier across all groups (18.5 – 32.5%). Chi-squared analyses indicated there was no significant differences in the rate at which this barrier was identified by men and women, X^2 (1, N = 134) = .832, p = .36, nor by STEM and non-STEM Faculty, X^2 (1, N = 134) = 3.207, p = .07.

“Interlibrary Loan service from the WKU Libraries” was identified as the most frequent facilitator by women (22.1) and non-STEM (20.0%) faculty, but had lower

identification rates by men (10.5%) and STEM faculty (13.0%). Chi-squared tests of independence indicated this difference was not significant between men and women, X^2 (1, N = 134) = 3.074, p = .08, nor between STEM and non-STEM faculty, X^2 (1, N = 134) = 1.123, p = .29.

In the "Research Funding" category, of the 16 response options, "Funding to attend conferences to present research" was identified across all groups (22.2 – 31.3%) as the most common facilitator (see Table 5). Only one barrier was identified by more than 10% of any group, "Administration communicating realistic and accurate expectations for available research funding."

Twenty-three possible facilitators and barriers were provided for the "Professional Development category," (see Table 6). "Department level funding for travel for professional conference" was identified as a facilitator at the highest rate across all groups (23.4 – 29.8%). This response option also was the most frequently identified barrier by men (19.3%), STEM faculty (9.3%), and non-STEM faculty (17.5%), but not women (10.4%).

Faculty were provided with 15 response options for "Promotion and Tenure Policies," (see Table 7). The response option "Departmental policy for P&T" was identified most frequently as a facilitator across all groups (16.7 – 28.1%). "Teaching load of pre-tenure faculty" was identified most frequently as a barrier by faculty across all groups (11.1 – 16.3%).

In the category "Hiring," 10 potential facilitators and barriers were provided by faculty. The response that had the highest rate of identification as a facilitator across all groups was "None" (8.8 – 15.6%); (see Table 8). "Supportive policies for dual career

couple" was identified most frequently as a barrier by faculty across all groups (5.6% - 10%).

Faculty were provided with 9 potential facilitators and barriers for "New Child Leave/FMLA Policies," (see Table 9). Among the facilitators, there were very low identification rates. "Courtesy of colleague(s) toward pregnant faculty member" had the highest response rate across all groups (1.8 – 6.5%). Fewer than eight faculty members identified any barriers, with the exception of "Covering responsibilities for another faculty on new-child leave without compensation" identified by 12 faculty members (2.5 – 7.4%).

Eleven potential facilitators and barriers were provided for the category "Other Policies," (see Table 10). "Flexibility in faculty schedules" was the most commonly identified facilitator across groups (11.3 – 20.4%). "Salaries accurately reflect value to WKU" was identified as a barrier at the greatest rate across all groups (23.4 – 28.1%).

In the category "Fairness of Implementation and Practice," faculty were provided with 20 potential facilitators and barriers (see Table 11). The option that had the highest rate of identification as a facilitator across all groups was "None" (6.3 – 11.1%). "Each faculty member contributing his/her fair share to non-teaching responsibilities" (11.3 – 14.8%) and "Equitable salaries based on qualifications and merit" (11.1 – 13.8%) were the options identified at the highest rate as barriers by faculty.

Of the 24 potential facilitators and barriers for "Administrative Leadership/Vision," the response "None" had the highest rate of identification as a facilitator across all groups, (see Table 12). "Trust in administration by faculty" was identified most frequently as a barrier across all groups (13.0 – 22.8%).

Faculty were provided with 29 potential facilitators and barriers for the category "Mentoring," (see Table 13). "Availability of appropriate role models" was identified more frequently by men (10.5%) and STEM faculty (13.0%) than by women (9.1%) and non-STEM faculty (7.5%). Chi-squared tests of independence indicated there was not a significant difference between men and women, X^2 (1, N = 134) = .098, p = .75 nor between STEM and non-STEM faculty, X^2 (1, N = 134) = 1.775, p = .18.

"Support of colleagues for teaching" was identified as a facilitator at the greatest rate by women (10.4%) and non-STEM faculty (12.5%) and at lower rates by men (8.8%) and STEM faculty (5.6%). However, chi-squared tests of independence indicated there was not a significant difference between men and women, X^2 (1, N = 134) = .077, p = .08, nor between STEM and non-STEM faculty, X^2 (1, N = 134) = 1.098, p = .30.

Discussion

The purpose of the current study was to investigate facilitators and barriers to women in STEM through comparison to men and non-STEM faculty members. I predicted that "Teaching," "Service," "Research Funding," "Mentoring," "Professional Development," "Administrative Leadership," "Hiring Policies," "New Child Leave/FMLA policies," and "Promotion and Tenure Policies" would be identified as barriers to a greater degree by women than by men and for STEM than by non-STEM academics. I also predicted that "Fairness of Policy Implementation and Practice," "Other Policies," and "Research Support other than Funding" would be identified as facilitators to a greater degree by women than by men and for STEM than by non-STEM academics. None of the hypotheses were confirmed. Contrary to the hypotheses, there were no

significant differences in the reported facilitators and barriers by women and men or by STEM and non-STEM faculty members.

Exploratory Analyses by Category

Exploratory analyses were conducted to identify differences between men and women in STEM for facilitators and barriers within each of the 12 categories. The largest differences between men and women in STEM were for the facilitators "Hiring Policies" and "New Child Leave/FMLA Policies." The former reached statistical significance, but the latter did not. Women in STEM were more likely to identify "Hiring Policies" as a facilitator than men in STEM. This finding suggests that STEM women more than were STEM men may have experienced career facilitation due to hiring policies. This was result was contrary to what was expected as gender disparities have been noted to exist in hiring policies, with men benefitting more (Bilimoria et al., 2011). There were not any large differences for barriers between men and women in STEM.

Exploratory Analyses for Specific Facilitators and Barriers within Categories

Exploratory analyses were conducted to identify differences between men and women and between STEM and non-STEM for specific facilitators and barriers within each of the 12 categories. There were very few differences that reached statistical significance. In fact, the only two differences that reached significance were the difference between men and women and the differences between STEM and non-STEM for the facilitator "Course load that enables research." Men were more likely than women and STEM were more likely than non-STEM to identify this as a facilitator. This finding suggests men more than women have received course load reductions for research, and that those in STEM have received more reductions for research than those in non-STEM.

The literature states that teaching and service responsibilities often fall more heavily on women than men faculty in STEM (Rosser, 2004). The finding that "Course load that enables research" as a facilitator was identified more by men than by women was expected. However, it was surprising that STEM more than non-STEM faculty were more likely to identify this facilitator.

Limitations

The study findings should be interpreted with caution due to certain limitations. First, the survey did not require responders to identify sex and STEM status. As the study's hypotheses were centered around identified differences between these variables, the sample of 242 faculty members was reduced to 134 due to participant non-identification of sex or STEM status. This 45% decrease from the initial sample likely led to decreased power for the analyses performed. The small sample also raises the question of selective participation. The university has approximately 775 full-time faculty. Thus, the initial response rate was approximately 31%, and was further reduced to approximately 17% for data analysis.

Second, the study used data collected from a convenience sample at a mid-sized, southeastern university. This resulted in a sample with a little diversity in terms of race/ethnicity. The final sample had 6.7% less minority representation than the distribution of reported demographics by faculty (Western Kentucky University, 2016). This underrepresentation of minority faculty may have resulted in responses with poor external validity for generalizing to all races/ethnicities.

The third limitation is that a self-report measure was used for the data collection; there is a possibility of response bias in reporting. Bias could predispose participants to

respond in a certain way. A conservative response bias could lead participants to respond yes to categories only if they experienced that facilitator or barrier regularly. The fourth limitation is the number of categories used; the survey provided 12 categories of facilitators and barriers to faculty. A factor analysis is a way to reduce the number of categories.

The fifth limitation is the structure of the survey that may have resulted in fatigue effects. In the informed consent section, the instructions stated "Depending on the number of facilitators an/or barriers you identify, it will take you approximately 20 to 40 minutes to complete the questionnaire." The questionnaire is designed in such a way that the more facilitators/barriers one identified, the longer the survey took to complete. Fatigue effects may have resulted in more facilitators/barriers being identified in the initial questions and fewer in later questions. When ranked from most to least amount of facilitators and barriers identified, the first three categories had the greatest number of identified responses. These categories (Teaching, Service, and Research Support other than Funding) were ranked 1st, 3rd, and 2nd, respectively in terms of the most categories identified. Of the 12 categories, the last three categories (Fairness of Policy Implementation and Practice, Administrative Leadership/Vision, and Mentoring) were ranked 10th, 6th, and 8th, respectively. This provides some support for the assumption that a fatigue effect may be present within the study.

Future Directions

Future studies might use a larger, more representative sample, increasing power in analyses and the generalizability of findings. The current study utilized a sample of 134 participants; of these, only 9 participants identified as themselves as minorities (i.e.,

Hispanic/Chicano/Latino, Asian, American Indian/Alaskan/Native/Aleut, and African American/Black). The current study was conducted with previously collected data; a future study may make responses to essential demographic items (e.g., STEM status and sex) required.

The current study presented the list of facilitators and barriers in the same order to all participants. The length of the survey may have led to fatigue effects resulting in more facilitators and barriers identified toward the beginning of the questionnaire and fewer toward the end. Future research with Bolton's (2016) survey may benefit from varying the order of presentation of facilitators and barriers to control for the potential fatigue effects of the survey. In addition, a future study could assess facilitators and barriers outside of a self-report format. Possible data collection strategies could involve assessing records of complaints from faculty with regard to career barriers or examining promotional data for commonalities in resources use as facilitators.

The current study also restricted the examination of facilitators and barriers to those in the survey developed by Bolton (2016). Future studies may wish to examine other possible categories not explored in this study. The current study examined the data from a survey that required identification of the 12 categories as facilitators or barriers to faculty careers. The original data used to develop the survey were examined using qualitative analyses to narrow down categories of facilitators or barriers. A future study could analyze the original data using quantitative analyses to examine the reported differences among facilitators and barriers of women and men in STEM/non-STEM.

Conclusion

The study contributes to the understanding of the facilitators and barriers encountered by men, women, STEM and non-STEM academics. The four hypotheses were not confirmed, and exploratory analyses revealed few significant differences between the aforementioned groups. The analyses were conducted both on the 12 broad categories and specific facilitators and barriers with the 12 categories. The broad analyses suggested that Hiring Policies may facilitate the careers of STEM women more than those of STEM men. The specific analyses suggested that men more than women may receive course load reductions for research. In addition, STEM more than non-STEM faculty may have a course load that enables research. The study provides some insight on differences in facilitator and barriers in the careers of women, men, STEM, and non-STEM faculty.

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APPENDIX A

Demographic Information

INFORMED CONSENT DOCUMENT

Identifying Facilitators and Barriers for WKU Faculty

Principal Investigator: Dr. Betsy Shoenfelt; betsy.shoenfelt@wku.edu

You are invited to participate in a study that is being conducted to address facilitators and barriers to faculty careers at WKU.

This is Part 2 of a 2-part study. The purpose of Part 1 was to elicit information that was used to inform the content of the questionnaire administered in this study, Part 2. In Part 1, 168 WKU faculty members identified actual examples of facilitators and barriers they encountered at WKU. These facilitators and barriers were supplemented by the empirical literature on facilitators and barriers for faculty careers in higher education, and were used to develop the questionnaire that follows.

You should keep a copy of this form for your records.

You will be asked to check which facilitators and barriers you have encountered in your career at WKU. You will then be asked to rate the strength of that facilitator and/or barrier. You have the option of adding a comment. Depending on the number of facilitators and/or barriers you identify, it will take you approximately 20 to 40 minutes to complete the questionnaire.

The results from this questionnaire will be used to inform work on an NSF grant under application by OCSE Dean, Dr. Cheryl Stevens. The purpose of this grant is to develop a more supportive culture at WKU that will enhance facilitators and remove (or reduce) barriers to faculty careers at WKU.

There are no known or anticipated risks to completing this questionnaire.
Please understand that it is not possible to identify all potential risks in a survey procedure. Reasonable safeguards have been taken to minimize both the known and potential but unknown risks.

All responses are anonymous. There is no personally identifying information requested; therefore, anonymity is assured. All results will be reported at the aggregate level; no individual responses will be reported.

We welcome and encourage your participation, but you are free to choose not to participate in this study without penalty or loss of any future services you may be entitled to from the University. Declining to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

You understand also that it is not possible to identify all potential risks in an experimental procedure, and you believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks.

Clicking on the following link will take you to the questionnaire and will imply your informed consent to participate in this study. Thank you for your participation!

URL GOES HERE

THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY
THE WESTERN KENTUCKY UNIVERSITY INSTITUTIONAL REVIEW BOARD
Paul Mooney, Human Protections Administrator
TELEPHONE: (270) 745-2129

Demographics

Responses are anonymous and only aggregated data will be reported. We would like to compare responses for groups such as males/females, rank, pre or post tenure. If you prefer not to respond to a demographic item, you may skip that item. Please answer the following demographic items.

Sex

- ◯ Male
- ◯ Female
- ◯ Prefer not to respond

Employment status

- ◯ Full-time
- ◯ Part-time

Rank

- ◯ Instructor
- ◯ Assistant Professor
- ◯ Associate Proffesor
- ◯ Full Professor

Tenure Status

- ◯ Non-tenure track
- ◯ Pre-tenure tenure track
- ◯ Tenured

Is your faculty position in a STEM discipline (Chemistry, Computer and Information Technology Science, Engineering, Geosciences, Life Sciences, Mathematical Sciences, Physics and Astronomy, Anthropology, Economics, Psychology, Sociology, and STEM Education and Learning Research)?

- ◯ Yes
- ◯ No

Please indicate the **primary** racial or ethnic group with which you identify. (If you are of a multi-racial or multi-ethnic background, indicate that group with which you identify **most of the time**.)

- ◯ African American/Black
- ◯ American Indian/Alaskan Native/Aleut
- ◯ Asian
- ◯ Hispanic/Chicano/Latino
- ◯ Middle Eastern
- ◯ Native Hawaiian/Other Pacific Islander
- ◯ White/Caucasian
- ◯ Other: (Please specify)
- ◯ Prefer not to respond

APPENDIX B

Identifying Facilitators and Barriers for WKU Faculty
Questionnaire Directions and Structure

Directions:

This survey is being conducted to support an NSF grant application submitted by Dr. Cheryl Stevens, Dean of Ogden College of Science and Engineering, and is intended to identify policies and practices that serve as facilitators or barriers to faculty careers at WKU. Most individuals will be able to complete this questionnaire in approximately 20 to 40 minutes.

This questionnaire is formatted in a manner different from most questionnaires you are familiar with. Please read the directions carefully.

This questionnaire contains 12 categories of potential facilitators or barriers to your career at WKU. These facilitators and barriers were identified from the survey administered to WKU faculty fall 2015 and from the research literature on academic careers.

The 12 categories of facilitators and barriers are:
1. Teaching
2. Service
3. Research Support Other Than Funding
4. Research Funding
5. Professional Development
6. Policies: Promotion and Tenure (P&T)
7. Policies: Hiring
8. Policies: New Child Leave/FMLA Policies
9. Policies: Other Policies
10. Fairness of Policy Implementation and Practice
11. Administrative Leadership/Vision
12. Mentoring

- For each of the 12 categories, you will be asked to identify BOTH facilitators and barriers that have had an ACTUAL SIGNIFICANT impact on your career at WKU.
- All potential facilitators/barriers have been written in neutral language as the same action or policy may serve as a facilitator or as a barrier for different faculty members. Thus, the lists of potential facilitators and potential barriers within a category are identical.
- Within each category, you will be limited in the number of facilitators and barriers you may identify. **Please identify only facilitators and barriers that have *actually* had a *significant* impact on your career at WKU.**

· You may skip any category that has not impacted your career at WKU.

DIRECTIONS FOR EACH CATEGORY

IDENTIFYING FACILITATORS
Within each category, you will first be asked to identify a limited number *of facilitators you have experienced at WKU that have had a significant impact* on your WKU career as a faculty member.

1. You will be asked to check which, if any, of the facilitators listed have actually served as a facilitator that significantly impacted your own career at WKU. For some categories, you likely will have NONE that apply to you.
2. You will be limited in the number of facilitators you may identify within each category.
3. When you identify an actual facilitator that has significantly impacted your career, you will be asked to rate the strength of this facilitator.
4. After rating the strength of the facilitator, you will then be given an opportunity to add a brief comment about the facilitator you identified.

IDENTIFYING BARRIERS
After you have identified which, if any, facilitators apply to you for a given category, you will then be asked to identify which, if any, barriers in the same category apply to you. You will be presented with the same list you saw when identifying facilitators. This time, you will be asked *to identify actual significant barriers to your career at WKU*. If you have not encountered barriers for a given category, you may skip to the next category.

1. You will be asked to check which, if any, of the barriers listed have actually served as a barrier that significantly impacted your own career at WKU. For some categories, you likely will have NONE that apply to you.
2. You will be limited in the number of barriers you may identify within each category.
3. When you identify an actual barrier that has significantly impacted your career, you will be asked to rate the strength of this barrier.
4. After rating the strength of the barrier, you will then be given an opportunity to add a brief comment about the barrier you identified.

NOTE:
· **Please do NOT identify *potential* facilitators or barriers.**
· **Please do NOT identify facilitators or barriers that you are familiar with from someone else's experience. Please *identify your own* facilitators and barriers.**
· **Please do NOT identify facilitators or barriers you experienced somewhere other than WKU.**
· **Please DO identify only facilitators and barriers that have *actually had a significant impact* on your career at WKU.**

Thank you!

Teaching

Have you encountered policies and practice related to **TEACHING** that **FACILITATED** your career at WKU?

- ◯ Yes
- ◯ No

You may check up three **FACILITATORS** related to **TEACHING**.

- ☐ Course reduction to write grant proposals
- ☐ Department head awarding teaching opportunities
- ☐ Opportunity to teach elective course(s) specific to area of expertise
- ☐ Reduced teaching load for new faculty
- ☐ Teaching an uncompensated overload
- ☐ Teaching a compensated overload
- ☐ Time requirements of teaching load
- ☐ Time requirements of administration duties
- ☐ Teaching core course(s) that other faculty lack expertise to teach
- ☐ Other: _____
- ☐ None in this category

Rate the strength of the selected facilitator(s).

	Not a facilitator	Minor facilitator	Moderate facilitator	Major facilitator
» Course reduction to write grant proposals	◯	◯	◯	◯
» Department head awarding teaching opportunities	◯	◯	◯	◯
» Opportunity to teach elective course(s) specific to area of expertise	◯	◯	◯	◯
» Reduced teaching load for new faculty	◯	◯	◯	◯
» Teaching an uncompensated overload	◯	◯	◯	◯
» Teaching a compensated overload	◯	◯	◯	◯
» Time requirements of teaching load	◯	◯	◯	◯
» Time requirements of administration duties	◯	◯	◯	◯
» Teaching core course(s) that other faculty lack expertise to teach	◯	◯	◯	◯
» Other: _____	◯	◯	◯	◯
» None in this category	◯	◯	◯	◯

Have you encountered policies and practice related to **TEACHING** that were **BARRIERS** to your career at WKU?

- ◯ Yes
- ◯ No

You may check up three **BARRIERS** related to **TEACHING**.

- ☐ Course reduction to write grant proposals
- ☐ Department head awarding teaching opportunities
- ☐ Opportunity to teach elective course(s) specific to area of expertise
- ☐ Reduced teaching load for new faculty
- ☐ Teaching an uncompensated overload
- ☐ Teaching a compensated overload
- ☐ Time requirements of teaching load
- ☐ Time requirements of administration duties
- ☐ Teaching core course(s) that other faculty lack expertise to teach
- ☐ Other: _____
- ☐ None in this category

Rate the strength of the selected barrier(s).

	Not a barrier	Minor barrier	Moderate barrier	Major barrier
» Course reduction to write grant proposals	◯	◯	◯	◯
» Department head awarding teaching opportunities	◯	◯	◯	◯
» Opportunity to teach elective course(s) specific to area of expertise	◯	◯	◯	◯
» Reduced teaching load for new faculty	◯	◯	◯	◯
» Teaching an uncompensated overload	◯	◯	◯	◯
» Teaching a compensated overload	◯	◯	◯	◯
» Time requirements of teaching load	◯	◯	◯	◯
» Time requirements of administration duties	◯	◯	◯	◯
» Teaching core course(s) that other faculty lack expertise to teach	◯	◯	◯	◯
» Other: _____	◯	◯	◯	◯
» None in this category	◯	◯	◯	◯

CIs Used as Response Options for All Categories

1. Teaching

Course reduction to write grant proposals

Department head awarding teaching opportunities

Opportunity to teach elective course(s) specific to area of expertise

Reduced teaching load for new faculty

Teaching an uncompensated overload

Teaching a compensated overload

Time requirements of teaching load

Time requirements of administration duties

Teaching core course(s) that other faculty lack expertise to teach

Other: _____

None in this category

2. Service

Compensation for extra service

Equitable distribution of service requirements

Flexibility in department allowing for service role opportunities

Reduced service responsibilities for new faculty

Service requirements

Other: _____

None in this category

3. Research Support Other Than Funding

Adequate research books in the library

Availability of sabbaticals

Course load that enables research

Course reduction to write grant proposal(s)

Department head finding appropriate lab space

Department size supporting sabbatical application

Earned course reduction to enable research time

Graduate Assistants

Interlibrary Loan service from the WKU Libraries

IRB policies and procedures are clearly explained

IRB policies and procedures are consistently enforced

IRB policies and procedures are accurately enforced

IRB applications are turned around/approved in a timely manner

IRB provides due process in investigating protocol questions

Staff support for research is provided on an objective basis (e.g., need, equally, or merit-based)

Support for building maintenance and repairs

Support staff dedicated to departmental instruments

Time to prepare grant proposals

Other: _____

None in this category

4. Research Funding

Administration communicating realistic and accurate expectations for available research funding

Funding early in research to gather preliminary data for larger grant proposals

Funding for graduate student research and travel

Funding for international travel to conduct research

Funding to attend conferences to present research

Internal funding for research

New faculty research funding/grants

Small grants to initiate research

Summer research grants

Startup funds for new faculty

Support for research for part-time faculty

Support for travel for part-time faculty

Quick turn around on small internal grants

Transparency in communicating how start-up money can be used

Other: _____

None in this category

5. Professional Development

Center for Faculty Development workshops on teaching and learning practices

Department head support to enable participation in distance learning programs

Department level funding for travel for professional conference

Departmental resources for creative endeavors

Development practices offered through the education and distance learning programs

Funding for additional training and education

Funding to attend conference workshops

Funding to earn required CEUs for licensing or certification

On-campus training and development to contribute to teaching

On-campus training and development to contribute to research

Opportunities for leadership development

Opportunities to network

Opportunities for professional development

Part-time faculty career path

Pre-tenure workshops on research

Pre-tenure workshops on service

Pre-tenure workshops on teaching

Pre-tenure workshops on work-life satisfaction

Pre-tenure workshops on grant writing

Professional development funding

University funding to attend professional development workshops/conferences

Other: _____

None in this category

6. Policies: Promotion and Tenure (P&T)

Ability of Provost to override department vote on P&T

Ability of Dean to override department P&T vote

Administrative responsibilities for pre-tenure faculty

Communicating realistic expectations for funding for research and travel to new faculty

Departmental policy for P&T

Different criteria across colleges in P&T requirements

Direction and feedback from department head regarding progress toward P&T

Discretion of Provost in finalizing P&T decisions

Instructor lines converted to tenure track

Requirement to meet standards in teaching, research, AND service for P&T

Requirement of administrator returning to faculty ranks to (re)apply for promotion

Policy separating tenure and promotion as independent decisions

Teaching load of pre-tenure faculty

Other: _____

None in this category

7. Policies: Hiring

Active recruitment of diverse faculty

Following process in WKU hiring protocol

Giving hiring preference to under-represented group members

Hiring based on ability of candidate to meet job requirements rather than personal preferences

Hiring based on knowledge, skill, and ability to perform job rather than irrelevant personal characteristics

Policy to conduct a search when a non-tenure track position is changed to tenure track

Policy to allow hiring temporary full-time faculty without a search

Supportive policies for dual career couples

Other: _____

None in this category

8. Policies: New Child Leave/FMLA Policies

Courtesy of colleague(s) toward pregnant faculty member

Covering responsibilities for another faculty on new-child leave without compensation

Covering responsibilities for another faculty on new-child leave with compensation

Department head working with faculty member to determine length of new child leave

Familiarity with pregnancy leave policy by dean

Familiarity with pregnancy leave policy by department head

Familiarity with pregnancy leave policy by faculty member

Interpretation of pregnancy leave policy by department head and/or dean

Receiving course load reduction with full pay while on new-child leave

Stopping the tenure clock for pregnant faculty member

Unpaid FMLA/maternity and paternity leave

Other: _____

None in this category

9. Policies: Other Policies

Availability of childcare

Flexibility in faculty schedules

Salaries accurately reflect value to WKU

Salaries at WKU as they compare to benchmark salaries

Salary compression

Support from counseling services when a traumatic event occurs in campus community

WKU faculty tuition waiver/scholarship

WKU parking policy

WKU policy to allow external faculty consulting

Other: _____

None in this category

10. Fairness of Policy Implementation and Practice

Administrators ensuring policies and practices are implemented without bias

Administrators providing support for dual-career couples

Colleagues who are supportive of individuals with disabilities

Consistently implementing ADA policies

Departmental recommendations to higher administration for funding based on merit rather than subjective or biased criteria

Department/University awards given based on merit rather than subjective or biased criteria

Each faculty member contributing his/her fair share to non-teaching responsibilities

Equally crediting men and women for contributions to university mission

Equally crediting men and women for creative input

Equitable salaries based on qualifications and merit

Freedom from retaliation for opposition to illegal discrimination on campus

Freedom from retaliation for making a claim or participation in investigations of illegal discrimination on campus

Opportunities for collaboration on grants are offered based on merit rather than subjective or biased criteria

Opportunities for teaching desired course are offered based on merit rather than subjective or biased criteria

Opportunities for article authorship are offered based on merit rather than subjective or biased criteria

Providing reasonable accommodations under ADA

Selectively enforcing policies

Top administrators consistently following policies and procedures

Other: _____

None in this category

11. Administrative Leadership/Vision

Assisting with transition to retirement

Compensation decisions based on merit rather than subjective or biased criteria

Considering consequences for faculty of administrative decisions

Creatively/flexibly implementing policies

Familiarity with policies and procedures

Giving benefit of doubt equally to men and women

Implementing innovative programs, policies, and practices

Implementing policies in a consistent manner

Making last minute decisions

Practices for funding different areas in university

Providing resources to support faculty

Referring faculty to appropriate policies and procedures

Recognizing work-life interaction in administering policies

Reflecting on institutional history, past policies, and current policies when making administrative decisions

Setting and communicating clear expectations for faculty performance decisions

Transparency in communication

Trust in administration by faculty

Trust in faculty

Truthfulness in communication from administration

Value administration places on service

Value administration places on grant work

Virtual hiring freeze on new faculty positions

Other: _____

None in this category

12. Mentoring

Availability of appropriate role models

Department head actively engaging in working with faculty on their research

Department head actively engaging in working with faculty on their service

Department head actively engaging in working with faculty on their teaching

Department head advising on grant opportunities

Department head collaborating with faculty on grant proposal

Department head encouraging research activity

Department head recommending professional development

Department head providing career guidance to faculty member

Department head providing direction and feedback regarding requirements for P&T

Faculty assisting on another faculty member's grant proposal preparation

Faculty working in isolation

Individual assistance from department head with research

Individual assistance from department head with service responsibilities

Individual assistance from department head on teaching practices

Senior faculty collaborating with junior faculty on research

Senior faculty initiating collaboration with junior faculty on research

Support for new program director appointed from current faculty

Support of colleagues for research

Support of colleagues for service

Support of colleagues for teaching

Support of dean for research

Support of dean for service

Support of dean for teaching

Support of department head for research

Support of department head for service

Support of department head for research

Other: _____

None in this category

APPENDIX C

Frequency Tables

Table 1
Frequency of STEM Faculty Identified Categories of Facilitators and Barriers

	Facilitators		Barriers	
Category	Men	Women	Men	Women
Teaching	18 (62.1)	18 (72.0)	16 (55.2)	14 (56.0)
Service	13 (44.8)	15 (60.0)	13 (44.8)	10 (40.0)
Research Support Other Than Funding	13 (44.8)	14 (56.0)	16 (55.2)	10 (40.0)
Research Funding	9 (31.0)	12 (48.0)	10 (34.5)	12 (48.0)
Professional Development	14 (48.3)	14 (56.0)	12 (41.4)	8 (32.0)
Promotion and Tenure (P&T) Policies	11 (37.9)	8 (32.0)	14 (48.3)	8 (32.0)
Hiring Policies	5 (17.2)*	13 (52.0)*	8 (27.6)	5 (20.0)
New Child Leave/FMLA Policies	2 (6.9)	7 (28.0)	4 (13.8)	5 (20.0)
Other Policies	9 (31.0)	10 (40.0)	12 (41.4)	6 (24.0)
Fairness of Policy Implementation and Practice	8 (27.6)	6 (24.0)	10 (34.5)	8 (32.0)
Administrative Leadership/Vision	12 (41.4)	9 (36.0)	13 (44.8)	8 (32.0)
Mentoring	11 (37.9)	10 (40.0)	13 (44.8)	6 (24.0)

Note: * X^2 Test of Independence $p < .05$. Table 1 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 2
Frequency of Identified Teaching Facilitators and Barriers

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Course reduction to write grant proposals	7 (12.3)	2 (2.6)	7 (13.0)	2 (2.5)	2 (3.5)	3 (3.9)	4 (7.4)	1 (1.3)
Department head awarding teaching opportunities	9 (5.8)	15 (19.5)	12 (22.2)	12 (15.0)	3 (5.3)	2 (2.6)	1 (1.9)	4 (5.0)
Opportunity to teach elective course(s) specific to area of expertise	17 (29.8)	23 (29.9)	18 (33.3)	22 (27.5)	2 (3.5)	1 (1.3)	0 (0.0)	3 (3.8)
Reduced teaching load for new faculty	13 (22.8)	15 (19.5)	12 (22.2)	16 (20.0)	0 (0.0)	5 (6.5)	3 (5.6)	2 (2.5)
Teaching an uncompensated overload	0 (0.0)	7 (9.1)	2 (3.7)	5 (6.3)	10 (17.5)	13 (16.9)	7 (13.0)	16 (20.0)
Teaching a compensated workload	4 (7.0)	10 (13.0)	5 (9.3)	9 (11.3)	4 (7.0)	1 (1.3)	1 (1.9)	4 (5.0)
Time requirements of teaching load	1 (1.8)	5 (6.5)	4 (7.4)	2 (2.5)	11 (19.3)	24 (31.2)	11 (20.4)	24 (30.0)
Time requirements of admin duties	2 (3.5)	5 (6.5)	3 (5.6)	4 (5.0)	10 (17.5)	15 (19.5)	9 (16.7)	16 (20.0)
Teaching core course(s) that other faculty lack expertise to teach	8 (14.0)	8 (10.4)	6 (11.1)	10 (12.5)	4 (7.0)	5 (6.5)	5 (9.3)	4 (5.0)
Other	1 (1.8)	4 (5.2)	3 (5.6)	2 (2.5)	5 (8.8)	10 (13.0)	2 (3.7)	13 (16.3)
None	1 (1.8)	3 (3.9)	0 (0.0)	4 (5.0)	3 (5.3)	3 (3.9)	5 (9.3)	1 (1.3)

Note: * X^2 Test of Independence $p < .05$. Table 2 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 3
Frequency of Identified Service Facilitators and Barriers

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Compensation for extra service	5 (8.8)	4 (5.2)	3 (5.6)	6 (7.5)	6 (10.5)	4 (5.2)	4 (7.4)	6 (7.5)
Equitable distribution of service requirements	4 (7.0)	4 (5.2)	2 (3.7)	6 (7.5)	10 (17.5)	10 (13.0)	9 (16.7)	11 (13.8)
Flexibility in department allowing for service role opportunities	15 (26.3)	21 (27.3)	12 (22.2)	24 (30.0)	3 (5.3)	3 (3.9)	3 (5.6)	3 (3.8)
Reduced service responsibilities for new faculty	5 (8.8)	11 (14.3)	9 (16.7)	7 (8.8)	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)
Service requirements	1 (1.8)	1 (1.3)	0 (0.0)	2 (2.5)	6 (10.5)	10 (13.0)	5 (9.3)	11 (13.8)
Other	1 (1.8)	5 (6.5)	3 (5.6)	3 (3.8)	2 (3.5)	6 (7.8)	3 (5.6)	5 (6.3)
None	3 (5.3)	5 (6.5)	4 (7.4)	4 (5.0)	6 (10.5)	3 (3.9)	3 (5.6)	6 (7.5)

Note: * X^2 Test of Independence $p < .05$. Table 3 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 4
Frequency of Identified Research Support other than Funding Facilitators and Barriers

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Adequate research books in the library	3 (5.3)	1 (1.3)	1 (1.9)	3 (3.8)	7 (12.6)	3 (3.9)	5 (9.3)	5 (6.3)
Availability of sabbaticals	4 (7.0)	6 (7.8)	3 (5.6)	8.8 ()	4 (7.0)	3 (3.9)	5 (9.3)	2 (2.5)
Course load that enables research	9 (15.8)	4 (5.2)	11 (20.4)	2 (2.5)	13 (22.8)	23 (29.9)	10 (18.5)	26 (32.5)
Course reduction to write grant proposal(s)	1 (1.8)*	1 (1.3)*	1 (1.9)*	1 (1.3)*	1 (1.8)	4 (5.2)	1 (1.9)	4 (5.0)
Department head finding appropriate lab space	2 (3.5)	4 (5.2)	5 (9.3)	1 (1.3)	1 (1.8)	2 (2.6)	3 (5.6)	0 (0.0)
Department size supporting sabbatical application	2 (3.5)	1 (1.3)	2 (3.7)	1 (1.3)	1 (1.8)	2 (2.6)	1 (1.9)	2 (2.5)
Earned course reduction to enable research time	3 (5.3)	4 (5.2)	5 (9.3)	2 (2.5)	2 (3.5)	2 (2.6)	1 (1.9)	3 (3.8)
Graduate Assistants	7 (12.3)	9 (11.7)	9 (16.7)	7 (8.8)	3 (5.3)	8 (10.4)	4 (7.4)	7 (8.8)
Interlibrary Loan service from the WKU Libraries	6 (10.5)	17 (22.1)	7 (13.0)	16 (20.0)	1 (1.8)	0 (0.0)	0 (0.0)	1 (1.3)
IRB policies and procedures are clearly explained	0 (0)	3 (3.9)	1 (1.9)	2 (2.5)	1 (1.8)	5 (6.5)	1 (1.9)	5 (6.3)

Note: * X^2 Test of Independence $p < .05$. Table 4 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 4 Continued

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
IRB policies and procedures are consistently enforced	0 (0.0)	3 (3.9)	0 (0.0)	1 (1.3)	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)
IRB policies and procedures are accurately enforced	1 (1.8)	1 (1.3)	2 (3.7)	0 (0.0)	2 (3.5)	4 (5.2)	2 (3.7)	4 (5.0)
IRB applications are turned around/approved in a timely manner	1 (1.8)	6 (7.8)	5 (9.3)	2 (2.5)	1 (1.8)	1 (1.3)	0 (0.0)	2 (2.5)
IRB provides due process in investigating protocol questions	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (2.6)	0 (0.0)	2 (2.5)
Staff support for research is provided on an objective basis	1 (1.8)	2 (2.6)	1 (1.9)	2 (2.5)	3 (5.3)	2 (2.6)	2 (3.7)	3 (3.8)
Support for building maintenance and repairs	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)	5 (8.8)	0 (0.0)	3 (5.6)	2 (2.5)
Support staff dedicated to departmental instruments	3 (5.3)	1 (1.3)	3 (5.6)	1 (1.3)	4 (7.0)	1 (1.3)	3 (5.6)	2 (2.5)
Time to prepare grant proposals	1 (1.8)	2 (2.6)	2 (3.7)	1 (1.3)	4 (7.0)	10 (13.0)	4 (7.4)	10 (12.5)
Other	4 (7.0)	7 (9.1)	2 (3.7)	9 (11.3)	5 (8.8)	4 (5.2)	0 (0.0)	9 (11.3)
None	0 (0.0)	3 (3.9)	2 (3.7)	1 (1.3)	2 (3.5)	4 (5.2)	5 (9.3)	1 (1.3)

Note:* X^2 Test of Independence $p < .05$. Table 4 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 5
Frequency of Identified Research Funding Facilitators and Barriers

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Administration communicating realistic and accurate expectations for available research funding	1 (1.8)	2 (2.6)	2 (3.7)	1 (1.3)	3 (5.3)	10 (13.0)	4 (7.4)	9 (11.3)
Funding early in research to gather preliminary data for larger grant proposals	3 (5.3)	1 (1.3)	4 (7.4)	0 (0.0)	0 (0.0)	3 (3.9)	1 (1.9)	2 (2.5)
Funding for graduate student research and travel	3 (5.3)	4 (5.2)	5 (9.3)	2 (2.5)	3 (5.3)	3 (3.9)	4 (7.4)	2 (2.5)
Funding for international travel to conduct research	2 (3.5)	1 (1.3)	0 (0.0)	3 (3.8)	5 (8.8)	2 (2.6)	1 (1.9)	6 (7.5)
Funding to attend conferences to present research	15 (26.3)	22 (28.6)	12 (22.2)	25 (31.3)	5 (8.8)	6 (7.8)	4 (7.4)	7 (8.8)
Internal funding for research	8 (14.0)	12 (15.6)	7 (13.0)	13 (16.3)	6 (10.5)	6 (7.8)	5 (9.3)	7 (8.8)
New faculty research funding/grants	4 (7.0)	7 (9.1)	3 (5.6)	8 (10)	1 (1.8)	6 (7.8)	3 (5.6)	4 (5.0)
Small grants to initiate research	1 (1.8)	2 (2.6)	1 (1.9)	2 (2.5)	0 (0.0)	2 (2.6)	2 (3.7)	0 (0.0)
Summer research grants	2 (3.5)	4 (5.2)	0 (0.0)	6 (7.5)	6 (10.5)	7 (9.1)	5 (9.3)	8 (10.0)

Note: * X^2 Test of Independence $p < .05$. Table 5 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 5 Continued

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Startup funds for new faculty	7 (12.3)	3 (3.9)	4 (7.4)	6 (7.5)	2 (3.5)	5 (6.5)	5 (9.3)	2 (2.5)
Support for research for part-time faculty	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.8)	3 (3.9)	2 (3.7)	2 (2.5)
Support for travel for part-time faculty	1 (1.8)	3 (3.9)	1 (1.9)	1 (1.3)	0 (0.0)	2 (2.6)	1 (1.9)	1 (1.3)
Quick turn around on small internal grants	1 (1.8)	3 (3.9)	1 (1.9)	3 (3.8)	0 (0.0)	1 (1.3)	1 (1.9)	0 (0.0)
Transparency in communicating how start-up money can be used	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (3.5)	1 (1.3)	2 (3.7)	1 (1.3)
Other	1 (1.8)	0 (0.0)	1 (1.9)	0 (0.0)	4 (7.0)	3 (3.9)	3 (5.6)	4 (5.0)
None	0 (0.0)	2 (2.6)	2 (3.7)	0 (0.0)	0 (0.0)	3 (3.9)	2 (3.7)	1 (1.3)

Note: * X^2 Test of Independence $p < .05$. Table 5 values are the number of faculty that identified the response option and those values inside parentheses are the percentages..

Table 6

Frequency of Identified Professional Development Facilitators and Barriers

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Center for Faculty Development workshops on teaching and learning practices	7 (12.3)	17 (22.1)	11 (20.4)	13 (16.3)	2 (3.5)	0 (0.0)	1 (1.9)	1 (1.3)
Department head support to enable participation in distance learning programs	1 (1.8)	4 (5.2)	1 (1.9)	4 (5.0)	1 (1.8)	0 (0.0)	0 (0.0)	1 (1.3)
Department level funding for travel for professional conference	17 (29.8)	18 (23.4)	15 (27.8)	20 (25.0)	11 (19.3)	8 (10.4)	5 (9.3)	14 (17.5)
Departmental resources for creative endeavors	4 (7.0)	1 (1.3)	2 (3.7)	3 (3.8)	3 (5.3)	6 (7.8)	3 (5.6)	6 (7.5)
Development practices offered through the education and distance learning programs	1 (1.8)	1 (1.3)	0 (0.0)	2 (2.5)	1 (1.8)	0 (0.0)	0 (0.0)	1 (1.3)
Funding for additional training and education	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)	5 (8.8)	9 (11.7)	3 (5.6)	11 (13.8)
Funding to attend conference workshops	6 (10.5)	8 (10.4)	2 (3.7)	12 (15.0)	8 (14.0)	4 (5.2)	3 (5.6)	9 (11.3)
Funding to earn required CEUs for licensing or certification	2 (3.5)	4 (5.2)	1 (1.9)	5 (6.3)	1 (1.8)	1 (1.3)	0 (0.0)	2 (2.5)

Note: * X^2 Test of Independence $p < .05$. Table 6 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 6 Continued

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
On-campus training and development to contribute to teaching	4 (7.0)	11 (14.3)	4 (7.4)	11 (13.8)	1 (1.8)	2 (2.6)	1 (1.9)	2 (2.5)
On-campus training and development to contribute to research	1 (1.8)	4 (5.2)	1 (1.9)	4 (5.0)	0 (0.0)	2 (2.6)	1 (1.9)	1 (1.3)
Opportunities for leadership development	4 (7.0)	4 (5.2)	3 (5.6)	5 (6.3)	3 (5.3)	1 (1.3)	2 (3.7)	2 (2.5)
Opportunities to network	0 (0.0)	4 (5.2)	1 (1.9)	3 (3.8)	1 (1.8)	0 (0.0)	1 (1.9)	0 (0.0)
Opportunities for professional development	1 (1.8)	8 (10.4)	0 (0.0)	9 (11.3)	3 (5.3)	0 (0.0)	0 (0.0)	3 (3.8)
Part-time faculty career path	0 (0.0)	1 (1.3)	1 (1.9)	0 (0.0)	1 (1.8)	2 (2.6)	1 (1.9)	2 (2.5)
Pre-tenure workshops on research	2 (3.5)	4 (5.2)	4 (7.4)	2 (2.5)	3 (5.3)	3 (3.9)	3 (5.6)	3 (3.8)
Pre-tenure workshops on service	0 (0.0)	1 (1.3)	1 (1.9)	0 (0.0)	0 (0.0)	1 (1.3)	1 (1.9)	0 (0.0)
Pre-tenure workshops on teaching	0 (0.0)	1 (1.3)	1 (1.9)	0 (0.0)	0 (0.0)	2 (2.6)	1 (1.9)	1 (1.3)
Pre-tenure workshops on work-life satisfaction	0 (0.0)	1 (1.3)	1 (1.9)	0 (0.0)	2 (3.5)	2 (2.6)	2 (3.7)	2 (2.5)

Note:* X^2 Test of Independence $p < .05$. Table 6 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 6 Continued

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Pre-tenure workshops on grant writing	2 (3.5)	0 (0.0)	1 (1.9)	1 (1.3)	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)
Professional development funding	4 (7.0)	5 (6.5)	2 (3.7)	7 (8.8)	5 (8.8)	4 (5.2)	2 (3.7)	7 (8.8)
University funding to attend professional development workshops/conferences	4 (7.0)	3 (3.9)	4 (7.4)	3 (3.8)	5 (8.8)	1 (1.3)	4 (7.4)	2 (2.5)
Other	2 (3.5)	2 (2.6)	2 (3.7)	2 (2.5)	0 (0.0)	5 (6.5)	1 (1.9)	4 (5.0)
None	1 (1.8)	1 (1.3)	0 (0.0)	2 (2.5)	2 (3.5)	4 (5.2)	3 (5.6)	3 (3.8)

Note: * X^2 Test of Independence $p < .05$. Table 6 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 7
Frequency of Identified Policies: P&T Facilitators and Barriers

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Ability of Provost to override department vote on P&T	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (3.5)	2 (2.6)	2 (3.7)	2 (2.5)
Ability of Dean to override department P&T vote	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (3.5)	2 (2.6)	3 (5.6)	1 (1.3)
Administrative responsibilities for pre-tenure faculty	3 (5.3)	0 (0.0)	2 (3.7)	1 (1.3)	5 (8.8)	7 (9.1)	4 (7.4)	8 (10.0)
Communicating realistic expectations for funding for research and travel to new faculty	4 (7.0)	3 (3.9)	3 (5.6)	4 (5.0)	1 (1.8)	3 (3.9)	1 (1.9)	3 (3.8)
Departmental policy for P&T	16 (28.1)	14 (18.2)	9 (16.7)	21 (26.3)	3 (5.3)	2 (2.6)	2 (3.7)	3 (3.8)
Different criteria across colleges in P&T requirements	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)	3 (5.3)	6 (7.8)	3 (5.6)	6 (7.5)
Direction and feedback from department head regarding progress toward P&T	13 (22.2)	13 (16.9)	8 (14.8)	18 (22.5)	1 (1.8)	7 (9.1)	2 (3.7)	6 (7.5)
Discretion of Provost in finalizing P&T decisions	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (3.5)	1 (1.3)	2 (3.7)	1 (1.3)

Note: * X^2 Test of Independence $p < .05$. Table 7 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 7 Continued

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Instructor lines converted to tenure track	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)	2 (3.5)	2 (2.6)	2 (3.7)	2 (2.5)
Requirement to meet standards in teaching, research, AND service for P&T	5 (8.8)	6 (7.8)	2 (3.7)	9 (11.3)	1 (1.8)	4 (5.2)	1 (1.9)	4 (5.0)
Requirement of administrator returning to faculty ranks to (re)apply for promotion	1 (1.8)	1 (1.3)	2 (3.7)	0 (0.0)	1 (1.8)	0 (0.0)	0 (0.0)	1 (1.3)
Policy separating tenure and promotion as independent decisions	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)	2 (3.5)	2 (2.6)	2 (3.7)	2 (2.5)
Teaching load of pre-tenure faculty	2 (3.5)	1 (1.3)	1 (1.9)	2 (2.5)	8 (14.0)	11 (14.3)	6 (11.1)	13 (16.3)
Other	2 (3.5)	1 (1.3)	0 (0.0)	3 (3.8)	2 (3.5)	6 (7.8)	1 (1.9)	7 (8.8)
None	1 (1.8)	5 (6.5)	4 (7.4)	2 (2.5)	5 (8.8)	2 (2.6)	4 (7.4)	3 (3.8)

Note: * X^2 Test of Independence $p < .05$. Table 7 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 8
Frequency of Identified Hiring Facilitators and Barriers

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Active recruitment of diverse faculty	1 (1.8)	5 (6.5)	2 (3.7)	4 (5.0)	3 (5.3)	1 (1.3)	2 (3.7)	2 (2.5)
Following process in WKU hiring protocol	2 (3.5)	5 (6.5)	1 (1.9)	6 (7.5)	5 (8.8)	4 (5.2)	4 (7.4)	5 (6.3)
Giving hiring preference to under-represented group members	1 (1.8)	1 (1.3)	0 (0.0)	2 (2.5)	3 (5.3)	2 (2.6)	1 (1.9)	4 (5.0)
Hiring based on ability of candidate to meet job requirements rather than personal preferences	5 (8.8)	6 (7.8)	3 (5.6)	8 (10.0)	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)
Hiring based on knowledge, skill, and ability to perform job rather than irrelevant personal characteristics	5 (8.8)	8 (10.4)	5 (9.3)	8 (10.0)	0 (0.0)	4 (5.2)	1 (1.9)	3 (3.8)
Policy to conduct a search when a non-tenure track position is changed to tenure track	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)
Policy to allow hiring temporary full-time faculty without a search	2 (3.5)	5 (6.5)	4 (7.4)	3 (3.8)	2 (3.5)	1 (1.3)	3 (5.6)	0 (0.0)
Supportive policies for dual career couples	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)	5 (8.8)	6 (7.8)	3 (5.6)	8 (10.0)

Note: * X^2 Test of Independence $p < .05$. Table 8 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 8 Continued

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Other	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	4 (7.0)	3 (3.9)	3 (5.6)	4 (5.0)
None	5 (8.8)	12 (15.6)	8 (14.8)	9 (11.3)	4 (7.0)	6 (7.8)	3 (5.6)	7 (8.8)

Note: * X^2 Test of Independence $p < .05$. Table 8 values are the number of faculty that identified the response option and those values inside parentheses are the percentages..

Table 9

Frequency of Identified New Child Leave/FMLA Policies Facilitators and Barriers

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Courtesy of colleague(s) toward pregnant faculty member	1 (1.8)	5 (6.5)	3 (5.6)	3 (3.8)	1 (1.8)	2 (2.6)	3 (5.6)	0 (0.0)
Covering responsibilities for another faculty on new-child leave without compensation	1 (1.8)	0 (0.0)	0 (0.0)	1 (1.3)	2 (3.5)	4 (5.2)	4 (7.4)	2 (2.5)
Covering responsibilities for another faculty on new-child leave with compensation	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.8)	0 (0.0)	1 (1.9)	0 (0.0)
Department head working with faculty member to determine length of new child leave	1 (1.8)	5 (6.5)	2 (3.7)	4 (5.0)	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)
Familiarity with pregnancy leave policy by dean	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Familiarity with pregnancy leave policy by department head	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)	0 (0.0)	3 (3.9)	1 (1.9)	2 (2.5)
Familiarity with pregnancy leave policy by faculty member	1 (1.8)	0 (0.0)	1 (1.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Note: * X^2 Test of Independence $p < .05$. Table 9 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 9 Continued

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Interpretation of pregnancy leave policy by department head and/or dean	0 (0.0)	1 (1.3)	1 (1.9)	0 (0.0)	0 (0.0)	4 (5.2)	1 (1.9)	3 (3.8)
Receiving course load reduction with full pay while on new-child leave	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)	3 (5.3)	0 (0.0)	3 (5.6)	0 (0.0)
Stopping the tenure clock for pregnant faculty member	0 (0.0)	1 (1.3)	1 (1.9)	0 (0.0)	1 (1.8)	1 (1.3)	2 (3.7)	0 (0.0)
Unpaid FMLA/maternity and paternity leave	0 (0.0)	1 (1.3)	1 (1.9)	0 (0.0)	1 (1.8)	2 (2.6)	2 (3.7)	1 (1.3)
Other	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)
None	0 (0.0)	4 (5.2)	3 (5.6)	1 (1.3)	1 (1.8)	2 (2.6)	0 (0.0)	3 (3.8)

Note: * X^2 Test of Independence $p < .05$. Table 9 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 10
Frequency of Identified Other Policies Facilitators and Barriers

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Availability of childcare	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.8)	5 (6.5)	2 (3.7)	4 (5.0)
Flexibility in faculty schedules	8 (14.0)	12 (15.6)	11 (20.4)	9 (11.3)	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)
Salaries accurately reflect value to WKU	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)	16 (28.1)	18 (23.4)	13 (24.1)	21 (26.3)
Salaries at WKU as they compare to benchmark salaries	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)	15 (26.3)	17 (22.1)	11 (20.4)	21 (26.3)
Salary compression	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)	11 (19.3)	13 (16.9)	10 (18.5)	14 (17.5)
Support from counseling services when a traumatic event occurs in campus community	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
WKU faculty tuition waiver/scholarship	5 (8.8)	7 (9.1)	2 (3.7)	10 (12.5)	1 (1.8)	0 (0.0)	0 (0.0)	1 (1.3)
WKU parking policy	1 (1.8)	2 (2.6)	1 (1.9)	2 (2.5)	4 (7.0)	1 (1.3)	1 (1.9)	4 (5.0)
WKU policy to allow external faculty consulting	5 (8.8)	4 (5.2)	7 (13.0)	2 (2.5)	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)

Note: * X^2 Test of Independence $p < .05$. Table 10 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 10 Continued

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Other	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.8)	2 (2.6)	1 (1.9)	2 (2.5)
None	4 (7.0)	6 (7.8)	5 (9.3)	5 (6.3)	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)

Note: * X^2 Test of Independence $p < .05$. Table 10 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 11
Frequency of Identified Fairness of Implementation and Practice Facilitators and Barriers

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Administrators ensuring policies and practices are implemented without bias	2 (3.5)	3 (3.9)	0 (0.0)	5 (6.3)	3 (5.3)	7 (9.1)	3 (5.6)	7 (8.8)
Administrators providing support for dual-career couples	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)	3 (5.3)	3 (3.9)	3 (5.6)	3 (3.8)
Colleagues who are supportive of individuals with disabilities	1 (1.8)	2 (2.6)	0 (0.0)	3 (3.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Consistently implementing ADA policies	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)	1 (1.8)	0 (0.0)	0 (0.0)	1 (1.3)
Departmental recommendations to higher administration for funding based on merit rather than subjective or biased criteria	2 (3.5)	3 (3.9)	2 (3.7)	3 (3.8)	1 (1.8)	2 (2.6)	0 (0.0)	3 (3.8)
Department/University awards given based on merit rather than subjective or biased criteria	1 (1.8)	3 (3.9)	2 (3.7)	2 (2.5)	1 (1.8)	1 (1.3)	0 (0.0)	2 (2.5)
Each faculty member contributing his/her fair share to non-teaching responsibilities	2 (3.5)	3 (3.9)	2 (3.7)	3 (3.8)	7 (12.3)	10 (13.0)	8 (14.8)	9 (11.3)

Note: * X^2 Test of Independence $p < .05$. Table 11 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 11 Continued

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Equally crediting men and women for contributions to university mission	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	7 (9.1)	4 (7.4)	3 (3.8)
Equally crediting men and women for creative input	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (3.9)	2 (3.7)	1 (1.3)
Equitable salaries based on qualifications and merit	1 (1.8)	0 (0.0)	1 (1.9)	0 (0.0)	7 (12.3)	10 (13.0)	6 (11.1)	11 (13.8)
Freedom from retaliation for opposition to illegal discrimination on campus	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (2.6)	0 (0.0)	2 (2.5)
Freedom from retaliation for making a claim or participation in investigations of illegal discrimination on campus	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)	1 (1.8)	4 (5.2)	1 (1.9)	4 (5.0)
Opportunities for collaboration on grants are offered based on merit rather than subjective or biased criteria	0 (0.0)	3 (3.9)	1 (1.9)	2 (2.5)	1 (1.8)	0 (0.0)	1 (1.9)	0 (0.0)
Opportunities for teaching desired course are offered based on merit rather than subjective or biased criteria	1 (1.8)	5 (6.5)	0 (0.0)	6 (7.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Note:* X^2 Test of Independence $p < .05$. Table 11 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 11 Continued

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Opportunities for article authorship are offered based on merit rather than subjective or biased criteria	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Providing reasonable accommodations under ADA	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)
Selectively enforcing policies	1 (1.8)	0 (0.0)	1 (1.9)	0 (0.0)	4 (7.0)	7 (9.1)	2 (3.7)	9 (11.3)
Top administrators consistently following policies and procedures	1 (1.8)	0 (0.0)	0 (0.0)	1 (1.3)	4 (7.0)	3 (3.9)	5 (9.3)	2 (2.5)
Other	0 (0.0)	2 (2.6)	0 (0.0)	2 (2.5)	3 (5.3)	2 (2.6)	1 (1.9)	4 (5.0)
None	5 (8.8)	6 (7.8)	6 (11.1)	5 (6.3)	1 (1.8)	3 (3.9)	1 (1.9)	3 (3.8)

Note: * X^2 Test of Independence $p < .05$. Table 11 values are the number of faculty that identified the response option and those values inside parentheses are the percentages..

Table 12

Frequency of Identified Administrative Leadership/Vision Facilitators and Barriers

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Assisting with transition to retirement	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Compensation decisions based on merit rather than subjective or biased criteria	1 (1.8)	0 (0.0)	0 (0.0)	1 (1.3)	4 (7.0)	5 (6.5)	5 (9.3)	4 (5.0)
Considering consequences for faculty of administrative decisions	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)	8 (14.0)	7 (9.1)	5 (9.3)	10 (12.5)
Creatively/flexibly implementing policies	2 (3.5)	3 (3.9)	1 (1.9)	4 (5.0)	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)
Familiarity with policies and procedures	2 (3.5)	3 (3.9)	2 (3.7)	3 (3.8)	1 (1.8)	1 (1.3)	0 (0.0)	2 (2.5)
Giving benefit of doubt equally to men and women	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Implementing innovative programs, policies, and practices	5 (8.8)	4 (5.2)	4 (7.4)	5 (6.3)	0 (0.0)	1 (1.3)	1 (1.9)	0 (0.0)
Implementing policies in a consistent manner	2 (3.5)	0 (0.0)	1 (1.9)	1 (1.3)	0 (0.0)	6 (7.8)	2 (3.7)	4 (5.0)
Making last minute decisions	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (5.3)	3 (3.9)	3 (5.6)	3 (3.8)
Practices for funding different areas in university	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (5.3)	8 (10.4)	4 (7.4)	7 (8.8)
Providing resources to support faculty	4 (7.0)	10 (13.0)	7 (13.0)	7 (8.8)	2 (3.5)	6 (7.8)	3 (5.6)	5 (6.3)

Note: * X^2 Test of Independence $p < .05$. Table 12 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 12 Continued

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Referring faculty to appropriate policies and procedures	2 (3.5)	1 (1.3)	0 (0.0)	3 (3.8)	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)
Recognizing work-life interaction in administering policies	2 (3.5)	1 (1.3)	2 (3.7)	1 (1.3)	3 (5.3)	3 (3.9)	0 (0.0)	6 (7.5)
Reflecting on institutional history, past policies, and current policies when making administrative decisions	2 (3.5)	2 (2.6)	2 (3.7)	2 (2.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Setting and communicating clear expectations for faculty performance decisions	5 (8.8)	1 (1.3)	2 (3.7)	4 (5.0)	3 (5.3)	5 (6.5)	1 (1.9)	7 (8.8)
Transparency in communication	1 (1.8)	4 (5.2)	0 (0.0)	5 (6.3)	5 (8.8)	7 (9.1)	4 (7.4)	8 (10.0)
Trust in administration by faculty	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)	13 (22.8)	10 (13.0)	9 (16.7)	14 (17.5)
Trust in faculty	1 (1.8)	2 (2.6)	3 (5.6)	0 (0.0)	4 (7.0)	3 (3.9)	3 (5.6)	4 (5.0)
Truthfulness in communication from administration	3 (5.3)	1 (1.3)	2 (3.7)	2 (2.5)	7 (12.3)	5 (6.5)	4 (7.4)	8 (10.0)
Value administration places on service	0 (0.0)	1 (1.3)	1 (1.9)	0 (0.0)	1 (1.8)	4 (5.2)	1 (1.9)	4 (5.0)

Note: * X^2 Test of Independence $p < .05$. Table 12 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 12 Continued

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Value administration places on grant work	0 (0.0)	1 (1.3)	1 (1.9)	0 (0.0)	1 (1.8)	0 (0.0)	0 (0.0)	1 (1.3)
Virtual hiring freeze on new faculty positions	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	7 (12.3)	7 (9.1)	3 (5.6)	11 (13.8)
Other	0 (0.0)	2 (2.6)	1 (1.9)	1 (1.3)	1 (1.8)	2 (2.6)	0 (0.0)	3 (3.8)
None	4 (7.0)	11 (14.3)	6 (11.1)	9 (11.3)	2 (3.5)	1 (1.3)	1 (1.9)	2 (2.5)

Note: * X^2 Test of Independence $p < .05$. Table 12 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 13

Frequency of Identified Mentoring Facilitators and Barriers

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Availability of appropriate role models	6 (10.5)	7 (9.1)	7 (13.0)	6 (7.5)	10 (17.5)	8 (10.4)	10 (18.5)	8 (10.0)
Department head actively engaging in working with faculty on their research	4 (7.0)	1 (1.3)	2 (3.7)	3 (3.8)	0 (0.0)	2 (2.6)	0 (0.0)	2 (2.5)
Department head actively engaging in working with faculty on their service	2 (3.5)	1 (1.3)	1 (1.9)	2 (2.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Department head actively engaging in working with faculty on their teaching	4 (7.0)	4 (5.2)	6 (11.1)	2 (2.5)	1 (1.8)	0 (0.0)	1 (1.9)	0 (0.0)
Department head advising on grant opportunities	0 (0.0)	1 (1.3)	1 (1.9)	0 (0.0)	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)
Department head collaborating with faculty on grant proposal	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)
Department head encouraging research activity	4 (7.0)	1 (1.3)	4 (7.4)	1 (1.3)	0 (0.0)	2 (2.6)	1 (1.9)	1 (1.3)
Department head recommending professional development	1 (1.8)	2 (2.6)	2 (3.7)	1 (1.3)	1 (1.8)	0 (0.0)	0 (0.0)	1 (1.3)
Department head providing career guidance to faculty member	2 (3.5)	2 (2.6)	0 (0.0)	4 (5.0)	1 (1.8)	3 (3.9)	2 (3.7)	2 (2.5)

Note: * X^2 Test of Independence $p < .05$. Table 13 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 13 Continued

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Department head providing direction and feedback regarding requirements for P&T	0 (0.0)	2 (2.6)	0 (0.0)	2 (2.5)	0 (0.0)	6 (7.8)	1 (1.9)	5 (6.3)
Faculty assisting on another faculty member's grant proposal preparation	2 (3.5)	3 (3.9)	2 (3.7)	3 (3.8)	1 (1.8)	0 (0.0)	1 (1.9)	0 (0.0)
Faculty working in isolation	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	5 (8.8)	10 (13.0)	7 (13.0)	8 (10.0)
Individual assistance from department head with research	1 (1.8)	0 (0.0)	1 (1.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Individual assistance from department head with service responsibilities	1 (1.8)	0 (0.0)	0 (0.0)	1 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Individual assistance from department head on teaching practices	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.8)	0 (0.0)	1 (1.9)	0 (0.0)
Senior faculty collaborating with junior faculty on research	1 (1.8)	5 (6.5)	2 (3.7)	4 (5.0)	2 (3.5)	2 (2.6)	2 (3.7)	2 (2.5)
Senior faculty initiating collaboration with junior faculty on research	2 (3.5)	1 (1.3)	1 (1.9)	2 (2.5)	1 (1.8)	3 (3.9)	2 (3.7)	2 (2.5)
Support for new program director appointed from current faculty	1 (1.8)	1 (1.3)	0 (0.0)	2 (2.5)	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)

Note: * X^2 Test of Independence $p < .05$. Table 13 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.

Table 13 Continued

Response	Facilitators				Barriers			
	Men	Women	STEM	Non-STEM	Men	Women	STEM	Non-STEM
Support of colleagues for research	1 (1.8)	6 (7.8)	1 (1.9)	6 (7.5)	2 (3.5)	0 (0.0)	2 (3.7)	0 (0.0)
Support of colleagues for service	1 (1.8)	5 (6.5)	1 (1.9)	5 (6.3)	1 (1.8)	0 (0.0)	0 (0.0)	1 (1.3)
Support of colleagues for teaching	5 (8.8)	8 (10.4)	3 (5.6)	10 (12.5)	0 (0.0)	2 (2.6)	1 (1.9)	1 (1.3)
Support of dean for research	5 (8.8)	3 (3.9)	3 (5.6)	5 (6.3)	1 (1.8)	1 (1.3)	2 (3.7)	0 (0.0)
Support of dean for service	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)	1 (1.8)	1 (1.3)	2 (3.7)	0 (0.0)
Support of dean for teaching	1 (1.8)	1 (1.3)	0 (0.0)	2 (2.5)	1 (1.8)	0 (0.0)	1 (1.9)	0 (0.0)
Support of department head for research	1 (1.8)	3 (3.9)	1 (1.9)	3 (3.8)	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)
Support of department head for service	0 (0.0)	2 (2.6)	1 (1.9)	1 (1.3)	0 (0.0)	2 (2.6)	1 (1.9)	1 (1.3)
Support of department head for teaching	1 (1.8)	0 (0.0)	1 (1.9)	0 (0.0)	0 (0.0)	1 (1.3)	1 (1.9)	0 (0.0)
Other	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)	1 (1.8)	1 (1.3)	1 (1.9)	1 (1.3)
None	1 (1.8)	2 (2.6)	3 (5.6)	0 (0.0)	2 (3.5)	2 (2.6)	0 (0.0)	4 (5.0)

Note:* X^2 Test of Independence $p < .05$. Table 13 values are the number of faculty that identified the response option and those values inside parentheses are the percentages.