Towards a Better Understanding of the Experiences of FB/FT STEM Faculty: A Systematic Review and Qualitative Meta-synthesis of the Literature through Intersectional Lenses of Gender and Race/Ethnicity

Dr. Sue Rosser, Provost Emerita, San Francisco State University

About the ARC Network
Funded by the National Science Foundation ADVANCE Program, Awards HRD-2121468 and HRD-1740860, the ADVANCE Resource and Coordination (ARC) Network seeks to achieve gender equity for faculty in higher education science, technology, engineering, and mathematics (STEM) disciplines. As the STEM equity brain trust, the ARC Network recognizes the achievements made so far while producing new perspectives, methods and interventions with an intersectional, intentional and inclusive lens. The leading champion in North America to propel the inclusion of women in the field of engineering, the Women in Engineering ProActive Network (WEPAN), serves as the backbone organization of the ARC Network.

About the Virtual Visiting Scholars
The Virtual Visiting Scholars (VVS) program provides a unique opportunity for select scholars across disciplines to pursue research meta-analysis, synthesis, and big data curation on topics crucial to STEM faculty equity. VVS analyze existing research and data, synthesizing different, sometimes competing, perspectives, frameworks, metrics, and outcomes to offer new insights and applications to the broader community.

About the Author
Dr. Sue Rosser became Provost Emerita at San Francisco State University, after serving as the Special Advisor for Research Development and External Partnerships for Academic and Student Affairs at the Chancellor’s Office of the California State University System (9/16-9/20) and as Provost and Vice President of Academic Affairs at San Francisco State University (8/09-9/16). She was the Dean of the Liberal Arts College at Georgia Institute of Technology (9/99-8/09), where she held the endowed Ivan Allen Dean’s Chair of Liberal Arts and Technology. Her research focuses on theoretical and applied aspects of women, science, health and technology, and she has authored over 140 journal articles and 14 books, the most recent being Academic Women in STEM Faculty (Palgrave Macmillan: 2017) and Breaking into the Lab: Engineering Progress for Women in Science (NYU Press: 2012).

She has held several grants from the National Science Foundation (NSF), including from 2001-2006 serving as co-PI on a $3.7 million ADVANCE grant, PI on InTEL: InteractiveToolkit for Engineering Learning ($900,000), Bridge to the Future for GIs ($217,732), and PI on an IT Catalyst ADVANCE grant ($250,000). She has served as a member of the external advisory board for more than a dozen ADVANCE grants as well as Senior Program Officer for Women’s Programs at NSF (1993—1994). She served as a Clayman Fellow at Stanford (2007-2008) and was on the American Association for the Advancement of Science Executive Board (2010-2014). Rosser received her B.A., M.S. and Ph.D. in Zoology from the University of Wisconsin-Madison.
Executive Summary

Limited research has focused on the experiences of foreign born/foreign trained (FB/FT) faculty compared to the US born/US trained (USB/UST) faculty, and even less has used the intersectional lens of gender to explore issues faced by FB/FT faculty who identify as women compared to either FB/FT faculty who identify as men or USB/UST faculty who identify as women in science, technology, engineering, and mathematics (STEM) departments. During the last two decades, the number of international or FB/FT faculty has increased dramatically in many STEM academic departments, so that they now constitute a substantial majority of faculty in most engineering, computer science, physical sciences and mathematics U.S. departments (NSB-NSF, 2021). Concurrently, universities have attempted to diversify their faculties, including those in STEM, with regard to gender and US-born/US trained (USB/UST) underrepresented minority (URM) faculty, partially in response to the imperative to have the faculty mirror the increasingly diverse student body and U.S. population. A burgeoning body of literature explores issues surrounding experiences of gender bias, discrimination, career progression and retention faced by STEM faculty, and increasing numbers of studies explore the experiences of racial/ethnic bias and discrimination of STEM faculty. The URM categories used by the National Science Foundation (NSF) and U.S. Census Bureau do not always correspond with how FB/FT faculty identify, raising questions as to the extent that studies of URM faculty also apply to FB/FT faculty of color.

This systematic review and meta-synthesis of over 3,287 pieces of literature published between 2001 and 2021 on FB/FT faculty using intersectional lenses of gender and of race/ethnicity provides valuable findings: 1) FB women appear to have different experiences compared to FB men and to USB women and men, 2) FB faculty tend to have different workload assignments than USB faculty, 3) FB faculty tended to cluster in R-1 institutions initially but are now also in comprehensive, regional universities and community colleges, 4) U.S. immigration policies as well as the political situation in the country of birth have significant impacts both upon the numbers and country of origin of FB faculty in the U.S., 5) Retention of FB faculty, especially women, depends partly on their integration into the broader community, as well as their department and institution, and 6) The pull of family and friends in country of origin makes many FB faculty feel they are not at home either in the country where they were born or in the U.S. These findings provide information that might be used to determine policies and practices recommended for universities, federal agencies and the U.S. government to make FB/FT women succeed in academic workplace environments evolved and traditionally populated by USB non-URM men.

Research Goal

This study proposes to provide a systematic review and qualitative meta-synthesis of the literature to explore the similarities and differences in academic workplace experiences between the Foreign Born/Foreign Trained (FB/FT) and other groups of Science, Technology, Engineering and Mathematics (STEM) faculty using intersectional lenses of gender and race/ethnicity.

Overview

Although a burgeoning literature, propelled partially by NSF programs such as ADVANCE (e.g. Gold et al., 2022; Rosser & Laursen, 2022; Zippel & Ferree, 2019) have focused on gender in STEM faculty, most do not consider the FB status of the faculty, while those that study trajectories of FB faculty do not focus on gendered experience; this results in FB women STEM faculty being overlooked and understudied. While data on international students are publicly available (e.g., ASEE, 2020; NSB-NSF, 2021) collecting data for faculty becomes very difficult because of privacy issues and rapid changes in residency status; most university employers only track FB status of the faculty for visa purposes, without linking it to any internal assessments as
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they do with gender and URM status. A small number of researchers (e.g., Akulli, 2015; Foote, et al., 2008; Rita & Karides, 2021; Wells, 2007) have studied the issues related to FB faculty in STEM.

While overall trends in recruiting and retaining more faculty who identify as women in STEM departments are promising, demographic markers such as URM status need to be carefully studied, especially with regard to FB status. NSB-NSF (2021) documents that the number of foreign students with doctoral degrees in STEM has been consistently increasing for almost two decades and hiring FB women in academia has also increased simultaneously. Most of these foreign nationals are eventually naturalized and become citizens. While the immigration status of these faculty is transitional, their specific cultural and racial identity carries forward. Unfortunately, the classification of these individuals in URM/Non-URM status is complicated (Rita & Karides, 2021), as 1) the URM definition used by NSF is based on underrepresentation in STEM fields relative to the overall U.S. population, but FB faculty are drawn from the world population where the ethnic groups adversely affected by systemic inequities may or may not align with the U.S. definitions; 2) FB faculty of Black and Hispanic backgrounds are included in URM, which raises the number of URM faculty but does not reflect an improvement in the including of historically underrepresented African American and Hispanic populations in the U.S.; 3) FB faculty of White and Asian backgrounds are not included in URM because they are not underrepresented in STEM relative to their proportion in the U.S. (although white and Asian women are underrepresented in some STEM fields), but many are still minorities in the education system and thus experience cultural isolation. Also, their experiences with bias are obscured when combined with USB non-URM experiences; Asian is an overly broad category that as a whole is overrepresented in STEM fields, but considering it as an aggregate masks pockets of under-represented USB minorities (e.g., Hmong, Vietnamese); and White aggregates European, North African, and Middle Eastern, making it difficult to distinguish the biases individuals from these different regions face. Furthermore, the definitions of whether Asians, who form the largest pool of PhD awardees in some STEM areas (e.g., engineering) are considered a racial minority vary between the NSF and U.S. Census Bureau, creating major gaps in understanding the demographic data on faculty in the professoriate.

Objectives of this Study
In this research, I had three significant objectives:

1. To conduct a systematic review and meta-synthesis of the extant literature on FB/FT STEM faculty using intersectional perspectives of gender and race/ethnicity to reveal gaps in the literature regarding the similarities and differences in academic workplace experiences between FB/FT and USB/UST women faculty as well as FB/FT women and men faculty and to show the extent to which U.S. URM definitions prove inadequate and lead to gaps in knowledge about experiences of FB/FT faculty.
2. To communicate the meta-synthesis results to encourage FB/FT and USB/UST faculty to realize differing perceptions of each other’s experiences in the workplace, scholars to research the gaps in knowledge, and administrators to better address shortcomings in the work environment.
3. To recommend policies, programs, and practices that can be tailored to better enhance inclusion, career success and retention of both FB/FT and USB/UST faculty of all genders and race/ethnicities based upon the information from the meta-synthesis and its widespread dissemination to the STEM academic community, including federal agencies.
Method
Choice of Meta-synthesis
I chose meta-synthesis rather than meta-analysis for this project for several reasons: 1) Many of the international students receiving PhDs become the academic faculty of STEM departments; most of these foreign nationals are eventually naturalized and become citizens, such that they can no longer be tracked over time as FB/FT. Thus, quantitative data on FB/FT faculty are difficult to obtain and unreliable, suggesting that qualitative data would likely yield more information on the experiences of these faculty. 2) Preliminary searches indicated that literature on FB/FT faculty is relatively limited but robust enough to identify additional themes and gaps. 3) Meta-synthesis allows the systematic review and integration of findings from qualitative studies of smaller numbers. 4) Meta-synthesis permits the use of “gray literature” including dissertations and non-peer reviewed materials such as professional society newsletters where information on experiences of FB/FT STEM faculty sometimes is published.

Databases, Keywords, and Criteria
Initial databases: The initial databases searched included the following: Springer, Wiley, Web of Science, Sociological Abstracts, Women’s Studies International, Race Relations Abstracts, Proquest and Theses Global, as well as databases from professional societies such as American Chemical Society (ACS), American Physical Society (APS), American Mathematical Society (AMS), American Society for Engineering Education (ASEE), Association for Computing Machinery (ACM).

Initial keywords focused on the following four fields: 1) foreign born or international, combined with 2) STEM faculty, combined with 3) gender or women, combined with 4) URM or race/ethnicity.

Initial inclusion criteria: a) published between 2001—2021; b) includes qualitative data; c) published in English; d) utilized a U.S. based sample in U.S. higher education institutions; e) included STEM faculty; f) included peer reviewed articles or books, dissertations, conference presentations and publications of professional societies.

Initial exclusion criteria: a) FB or international faculty in medical schools; b) FB researchers at universities who are not defined as faculty; c) FB researchers outside of academic institutions (i.e. employed by corporations or government).

Results
Although all of the initial databases in the proposal were searched, Springer, Wiley, Proquest and Proquest Theses Global, and Sociological Abstracts were most useful. The databases from professional societies yielded minimal articles. I had not anticipated that much of the useful literature was published in journals and books focused on higher education. Thus, Taylor and Francis books and journals, as well as EBSCO e-journals proved to be useful additions to databases searched, along with Proquest education and Wiley education databases.

Applying all initial four keyword fields in combination yielded no or 1-2 results in virtually all searches. The fourth field of URM or race/ethnicity was especially problematic, as most of the research on FB faculty lumps all races/ethnicities together. In some instances, race/ethnicity is treated as a variable, but it is not then intersected with gender or FB status in analyses. Some of the included qualitative studies focus only on experiences of FB women faculty from one race/ethnicity such as Asian women in STEM, but their experiences...
are not compared to experiences of USB women or of FB men in STEM. All studies in the final meta-synthesis included the initial three keyword fields of FB, STEM and gender.

Initial searches yielded 3,287 articles, chapters, or other literature from databases (2,531) and other sources such as websites, organizations and citation searches (756) possibly relevant to experiences of FB/FT women faculty in STEM. Removing duplicates and applying most of the initial inclusion/exclusion criteria led to 99 articles, 75 from databases and 24 from other sources, to be assessed for inclusion in the review. Forty-one of these articles that used qualitative or mixed methods were assessed further for determination of whether they merited inclusion in the final review; the other 58 used quantitative methods and were not included in the final meta-synthesis, except as introductory or background materials for the final report. I anticipated that a number of the 41 qualitative or mixed methods articles would not be in the final review, depending upon how strictly the inclusion/exclusion and intersectionality criteria were applied (see PRISMA Diagram above).

For the initial searches that yielded the 99 articles that I downloaded and read, I applied all of the initial inclusion/exclusion criteria with the exception of b) includes qualitative data, based upon advice from an ARC Research Advisory Board member, who suggested that literature based on quantitative methods could be used to direct towards themes in the qualitative research. The 99 articles include 58 such quantitative articles, not included in the final review, except as background in this final report, although they were used in developing the themes and subthemes (see Appendix 3).

In this final report, 30 qualitative or mixed methods articles were ultimately included. 11 were eliminated for these reasons: Five because upon closer analysis, it was clear they were not STEM faculty; one turned out to really be quantitative upon closer analysis; one only included Black African men, with no comparisons to women; one was not really FB, nor was it intersectional; one was not U.S.-based; one focused on Puerto Ricans
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in Puerto Rico, so did not really include FB. One did not separate USB and FB results (see Appendix 2 of articles excluded).

Closer reading of each of the 30 articles allowed me to select themes through an iterative process of categorization and analysis of the content (Cooper, 2017; Finfgeld-Connett, 2018). It permitted the charting of articles based upon the following categories: type of publication, year published, peer review status; type of institution studied; method used in study (mixed or purely qualitative); disciplinary fields; primary discipline; foreign born; gender (see Chart 1 above).

Careful reading of each of the 30 articles and use of the keywords allowed charting of several themes: FB vs USB compared, gender of subjects studied, FB male vs FB female compared, FB female vs USB female compared, race/URM, workload issues of teaching (with language as a subset), research, and service; immigration issues; pull of country of origin vs U.S. (see Chart 2 below).

<table>
<thead>
<tr>
<th>Number</th>
<th>1st Auth</th>
<th>Pub + yr</th>
<th>Peer</th>
<th>Type Org</th>
<th>Method</th>
<th>Field</th>
<th>Primary disciplines</th>
<th>FB</th>
<th>Gender</th>
</tr>
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<tr>
<td>1</td>
<td>Abla</td>
<td>Diss. 2012 Commi R-1,2, MA</td>
<td>Qual-Inter Multiple</td>
<td>STEM +</td>
<td>yes</td>
<td>Both</td>
<td></td>
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<td>2</td>
<td>Afoaku</td>
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<td>Qual-Inter Multiple</td>
<td>2/8 STEM</td>
<td>yes</td>
<td>women</td>
<td></td>
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<td>3</td>
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<td>Qual-Inter Multiple</td>
<td>1/8 STEM</td>
<td>yes</td>
<td>women</td>
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<td>4</td>
<td>Alberts</td>
<td>2008 Yes</td>
<td>R-1,0.uni</td>
<td>Mixed</td>
<td>Geography</td>
<td>Geography</td>
<td>yes</td>
<td>Both</td>
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<td>5</td>
<td>Boafo-Art</td>
<td>yes--chap</td>
<td>not spec</td>
<td>Rev. Art</td>
<td>Multiple</td>
<td>not esp STEM</td>
<td>yes</td>
<td>Both</td>
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<td>6</td>
<td>Canargarajah</td>
<td>2018 yes</td>
<td>R-1</td>
<td>Qual-Inter Multiple</td>
<td>all STEM</td>
<td>yes-Chin</td>
<td>Both</td>
<td></td>
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<tr>
<td>7</td>
<td>Carrattini</td>
<td>diss. 2015 Commi R-1</td>
<td>qual-inter Multiple</td>
<td>STEM +</td>
<td>yes</td>
<td>Both</td>
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<td>8</td>
<td>Carrattini</td>
<td>2013 maybe</td>
<td>R-1</td>
<td>qual-inter Multiple</td>
<td>STEM +</td>
<td>yes</td>
<td>Both</td>
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<tr>
<td>9</td>
<td>Chena</td>
<td>2018 yes</td>
<td>not spec</td>
<td>qual-inter Multiple</td>
<td>not esp STEM</td>
<td>yes</td>
<td>Both</td>
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<td>10</td>
<td>Ghosh</td>
<td>Diss.2015 Commi R-1</td>
<td>qual-inter Multiple</td>
<td>STEM +</td>
<td>yes</td>
<td>Both</td>
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<td>11</td>
<td>Ghosh</td>
<td>2021 yes</td>
<td>R-1</td>
<td>qual-inter Multiple</td>
<td>STEM +</td>
<td>yes</td>
<td>Both</td>
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<td>12</td>
<td>Goodroad</td>
<td>Diss. 2019 Commi 2 year</td>
<td>qual-inter Multiple</td>
<td>not esp STEM</td>
<td>yes</td>
<td>Both</td>
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<tr>
<td>13</td>
<td>Hernandez</td>
<td>2019 yes--chap</td>
<td>not spec</td>
<td>Rev. Art</td>
<td>Multiple</td>
<td>yes</td>
<td>Both</td>
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<tr>
<td>14</td>
<td>Howe</td>
<td>Diss. 2011 Commi R-1</td>
<td>qual-inter Multiple</td>
<td>6/11 STEM</td>
<td>yes</td>
<td>Both</td>
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<td>15</td>
<td>Lawless</td>
<td>2017 yes</td>
<td>not spec</td>
<td>qual-inter Multiple</td>
<td>not esp STEM</td>
<td>yes</td>
<td>women</td>
<td></td>
<td></td>
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<tr>
<td>16</td>
<td>Lightner-N</td>
<td>Diss. 2021 Commi R-1, R-2</td>
<td>qual-inter Multiple</td>
<td>all STEM</td>
<td>yes</td>
<td>women</td>
<td></td>
<td></td>
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<tr>
<td>17</td>
<td>Ochukpue</td>
<td>Diss.2004 Commi</td>
<td>HBCU</td>
<td>qual-inter Multiple</td>
<td>6/8 STEM</td>
<td>yes</td>
<td>Both</td>
<td></td>
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<tr>
<td>18</td>
<td>Roy</td>
<td>Diss. 2019 Commi R-1--CC</td>
<td>qual-inter Multiple</td>
<td>STEM+ hum</td>
<td>yes</td>
<td>women</td>
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<tr>
<td>19</td>
<td>Sharma</td>
<td>2021 yes</td>
<td>Univ.</td>
<td>qual-inter Multiple</td>
<td>all STEM</td>
<td>yes</td>
<td>Both</td>
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<tr>
<td>20</td>
<td>Skachkova</td>
<td>2007 Yes</td>
<td>R-1</td>
<td>qual-inter Multiple</td>
<td>STEM +</td>
<td>yes</td>
<td>women</td>
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<tr>
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<td>Switzer</td>
<td>Diss. 2012 Commi R-2</td>
<td>Qual-inter Multiple</td>
<td>8/11 STEM</td>
<td>yes</td>
<td>Both</td>
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<tr>
<td>22</td>
<td>Theobold</td>
<td>2009 yes</td>
<td>all types</td>
<td>Mixed</td>
<td>Geography</td>
<td>Geography</td>
<td>yes</td>
<td>Both</td>
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<tr>
<td>23</td>
<td>Veliz</td>
<td>Diss. 2014 Commi R-2</td>
<td>Qual-inter Multiple</td>
<td>9/12 STEM</td>
<td>yes</td>
<td>women</td>
<td></td>
<td></td>
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<tr>
<td>24</td>
<td>Veliz</td>
<td>2019 yes</td>
<td>R-2</td>
<td>Qual-inter Multiple</td>
<td>9/12 STEM</td>
<td>yes</td>
<td>women</td>
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<td>25</td>
<td>Wei</td>
<td>Diss. 2007 Commi</td>
<td>R-1</td>
<td>qual-inter Multiple</td>
<td>STEM +</td>
<td>yes</td>
<td>Both</td>
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<td>26</td>
<td>Wittenste</td>
<td>2020 yes</td>
<td>all types</td>
<td>qual-inter Multiple</td>
<td>not STEM</td>
<td>yes</td>
<td>women</td>
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<td>27</td>
<td>Xue</td>
<td>Diss. 2016 Commi R-2</td>
<td>qual-inter Multiple</td>
<td>most STEM</td>
<td>yes</td>
<td>women</td>
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<td>28</td>
<td>Yakaboski</td>
<td>2016 yes</td>
<td>R-1</td>
<td>qual-inter Multiple</td>
<td>all STEM</td>
<td>yes</td>
<td>women</td>
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<tr>
<td>29</td>
<td>Young</td>
<td>Diss. 2012 Commi all types</td>
<td>Mixed</td>
<td>Mech. Eng ME only</td>
<td>yes</td>
<td>Both</td>
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<td>30</td>
<td>Zanin-Yos</td>
<td>Diss.2020 Commi</td>
<td>pub. Univ</td>
<td>qual-inter Multiple</td>
<td>5/11 STEM</td>
<td>yes</td>
<td>Both</td>
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I would like to note that I also used the keywords and similar charting to aid in developing the themes, using the template guide for study note taking (see Appendix 4). Within the themes, tags (placed in parentheses and indented in Appendix 4) were used for both the quantitative and qualitative articles for emergent subthemes. For example, subthemes within workload include the following: a) teaching, with further subthemes tags of language issues, production of student credit hours, student discrimination, evaluations, b) research, with further subthemes of difficulties of obtaining collaborations and visibility for women, ineligibility for some funding due to immigration status and c) service with subthemes such as different and less important committee assignments, difficulties obtaining leadership positions, and stereotypical gender role and cultural expectations for FB women for service. The quotations in Finding 2 in the next section reflect these subthemes. Similarly, subthemes emerged for each of the other five findings and are reflected in the quotations below from the articles included in the study.

**Findings**

Although the qualitative studies provide rich examples of issues facing FB women faculty, particularly women of color, which vary considerably, depending upon the country of origin of the individual and her immigration path to the United States, six overarching findings emerge from the literature. Each of these findings presented below is described briefly with quotations from the qualitative literature to illustrate examples of each finding:

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1. **FB women appear to have different experiences compared to FB men and to USB women and men**

   Depending upon their race/ethnicity, FB women often experience the double bind of racism and sexism, which when combined with discrimination that sometimes accompanies FB status, results in a triple bind.

   A Black African faculty member at a primarily white institution (PWI) stated: I encountered a lot of challenges when I first started. I spoke a slightly different accent coming from Africa! Students appeared disinterested when they started the class. Students later were amazed about where I gained knowledge in chemistry because the image of Africa they have come to know is a poor struggling country with her nationals killing one another. I had to explain several times that Africa is a continent of 54 countries. (Boafu-Arthur, 2021, p.4)

   Both USB faculty and students may have stereotypical expectations for women from certain cultures, for example, expecting women from some Asian cultures to be deferent and dress in particular ways. Some FB women have found that if FB men from their country of origin are also in their department or college, the FB men may treat them differently than they do USB women, based upon gender and/or religious expectations for women in their country of origin. FB women may not be included in networks for research collaboration in which FB men and USB women and men participate. Those FB women in STEM who initially enter the U.S. via their husband, face particular career advancement barriers.

   An Indian physics associate professor said: A lot of women marry people senior to them. So, [if] he’s more advanced in his career than she is, then she falls farther and farther behind because his professorship is always more important than her assistant professorship. (Yakaboski, 2016, p. 76)

2. **FB faculty tend to have different workload assignments than USB faculty**

   Many studies, particularly in the quantitative literature (Corley & Shbharwal, 2007; Mamiseishvili & Rosser, 2010) have documented that FB faculty, both women and men, tend to be more productive than USB faculty in research, as measured by peer-reviewed articles, books, and other scholarly publications.

   A Chinese STEM woman faculty said: To get tenured, it is not only just getting your research funded and published, there are other things like visibility and leadership. All these kinds of things you need to start to consider; then I think it’s all the cultural differences start to kick in…there is a lot of human interaction, your interaction with your chair, with your peers so that started to show like the culture difference is indeed there. (Lightner-Noll, 2021, p. 80)

   Perhaps for this reason, FB faculty have workloads that reflect more time devoted to research and less to teaching and service in institutions that allow differential workload assignments. Simultaneously, because FB faculty are not eligible to apply for certain grants until they become citizens or permanent residents, their research productivity may be inhibited.

   Denise, an assistant professor in the STEM fields, stated as follows: Being international has been a challenge because it prevents you from being able to apply for different grants. It is hard because you can have your good research to win that award but, without that paperwork, you can’t apply for them. So, for my career, I have missed quite a few opportunities because of that status. (Veliz, 2019, p. 12)
Studies (Mamiseishvili, 2010; Mamiseishvili, 2011; Mamiseishvili & Rosser, 2010) have documented that FB faculty produce fewer student credit hours; a few studies have suggested the lower number of student credit hours results from lower numbers of students per class rather than assignments to teach fewer classes. Considerable research has documented that language issues and accents cause many students to avoid classes taught by FB faculty; this is particularly true for Asian-born faculty.

A USB student said: “When scheduling classes, make sure your professor’s name sounds American,” I was told by several of my friends who were already in college. Several students reported having received similar advice “because school is already hard enough without having to struggle with trying to understand what your professor is saying”. (Alberts, 2008, p. 192)

Many FB faculty discuss spending considerable time improving their English and preparing for classes, to overcome the language deficit they feel that they have.

Sanki, a biology professor from South Korea: I had a problem with accent and students reflected that in their review. But I wanted good reviews for my tenure and promotion . . . So I tried my best now I went to Toastmasters club . . . Public speaking is one of the biggest fears for everybody . . . the club meets once a week. (Sharma & Ibtesam, 2021, p. 5)

Particularly if they did not receive any of their education in the United States, FB faculty struggle with understanding U.S. higher education and its expectations for students.

An African professor with experience in the European system summed these points up as follows: In Europe and Africa the only thing universities are interested in is to make people competent. If you are not competent, you don’t graduate. Here you want to please the student, so it is a different scenario. (Alberts, 2008, p. 197)

FB faculty tend to spend less time on service activities and to be assigned different service activities than USB faculty. In some cases, the service assignments FB faculty receive are focused on their FB status, for example, organizing events for international day or celebrations.

Leela, a Full Professor from South Asia, discussed university efforts to create cultural awareness on campus. She said: This idea like multiculturalism, that’s something I don’t like. I don’t like being invited as the [South Asian] in this multicultural event, sort of pigeonholed in a bracket where I am expected to get some [ethnic food] and wear a certain costume and show up. I don’t like that because multiculturalism reinforces difference and makes it purely a matter of culture. (Ghosh & Barber, 2021, p. 1071)

FB faculty are appointed to fewer “important” committees and those that are likely to result in leadership opportunities at the departmental, college or university level. FB women faculty, especially those from Asia, feel that they are not considered for leadership positions.

Almost at the end of her academic career, one foreign-born full professor realized the disadvantage of not being involved actively in administration: Now when I look back at my career, I could see a lack of leadership . . . And this leadership is difficult for a foreigner because I was raised in a traditional role, i.e.,
to be a little violet – you don’t want to open your mouth with your accent. So it’s difficult. And many women don’t know that they have to learn how to develop the skill how to run a meeting, how to be a leader. (Skachkova, 2007, p. 717)

3. FB faculty tended to cluster in R-1 institutions initially but are now also in comprehensive, regional universities

Until the early 2000s, FB faculty were concentrated primarily in research-extensive and -intensive institutions, although some also found employment in liberal arts colleges. More recently, particularly with changes brought about by the Immigration Act of 1990 that expanded the number of immigrants, granted priority visas to highly skilled and educated workers, and created the temporary H-1B visas allowing employment, more international students received their PhDs from U.S. institutions and remained in the U.S. for employment, particularly in STEM fields. Regional comprehensive institutions, four year private and public institutions, and even community colleges, have now hired significant numbers of FB faculty.

A geography faculty member stated: My university will not sponsor a green card till I get tenure; therefore, I am not eligible for early career funding from NSF or NASA compared to American colleagues. I had to take a job which emphasizes teaching (13—18 credit hours per semester) because I do not have the same access to research funds as my American colleagues. (Theobold, 2009, p.23)

Since China, India, and South Korea are the countries from which the largest number of international students in STEM come, that is reflected in the FB faculty recently hired.

4. U.S. immigration policies as well as the political situation in the country of birth have significant impacts both upon the numbers and country of origin of FB faculty in U.S.

These policies and political changes create what economists define as pull and push situations that encourage increases in FB faculty in the U.S. For example, in the wake of the fall of the Berlin wall and the end of the Cold War, many FB faculty immigrated from Eastern Europe and former Soviet bloc countries and became STEM faculty in the U.S. The revolution in Iran pushed many Iranian scientists and scholars to immigrate to the U.S. and other countries.

A faculty member from Iran stated: Things changed in Iran. We came here to get an education, and go back, and help with the revolution. But...things changed. The revolution changed. Kids came along and . . this became our home basically. The last time that I went was five years ago, and each year I want to go but can't because of engagements here. (Carrattini, 2013, p.5)

The U.S. Immigration Act of 1990 allowed many more international students to come to the U.S. on visas to study and then remain in the U.S. In 2022, the Biden-Harris administration clarified that students on F-1 visas earning bachelor’s, master’s, and PhD degrees could remain in the U.S. an additional 36 months to complete optional practical training if they were in “high demand professional fields such as STEM”. This has significantly increased the number of FB STEM faculty, especially from Asia. A few women discussed how difficulties of their visa processing affected their career decision-making.

As an Indian national, Pema’s visa retrogression triggered her job search though she was happy with her position at the time. She said: I think retrogression happened at that time. And the date, which was current, for the visa numbers, went back 5 years, which meant for people from India and China, so there
was 10 Y. No way I could have been there for 4–5 years and so that was one of the reasons that triggered my job search again. (Chena & Lawless, 2018, pp. 10-11).

Even FB faculty coming from European countries experience issues with immigration that can complicate their careers when transitioning to the U.S.:

Ashley, a professor from a European country, shared the following: I was supposed to start my position in September and supposedly my visa was lost in the mail so they had to ask for a copy. When it finally arrived somebody else was teaching my class … my teaching evaluations were horrible the first time I was teaching a class. (Veliz, 2019, p. 12)

5. Retention of FB faculty, especially women, depends partly on their integration into the broader community, as well as their department and institution

Several studies have shown that FB faculty may experience difficulty with isolation at the university, although they may feel better integrated into their departmental, college, and university community compared to their integration into the surrounding community in which they live.

Agnese, a woman faculty member from Southern Europe, for example, explained that men with whom she works “go out for coffee, or they have dinner parties at their houses, and they don’t invite me.” As the only woman in her department, she is isolated in ways that might appear informal and inconsequential but matter very much in terms of occupational mobility because these men will be the voting members on her tenure case. (Ghosh and Barber, 2021, p. 1075)

This may be particularly true of FB faculty in small towns and rural communities where there may be very few FB individuals, especially professionals, not affiliated with the university. FB faculty who are perceived as racial/ethnic minorities in these settings may experience discrimination in the broader community, even when they feel accepted at the university.

Also, that is one thing that helped me a lot adjusting to this culture and also we have faculty that are also like Asian and they really welcome us to some activities outside school, like inviting us to their parties and just getting us familiar with the environment. And gradually, once I passed those, I started to work with improving my language by talking to people, by talking to English native speakers. (Lightner-Noll, 2021, p. 93)

FB women faculty in STEM may be especially isolated in the community, even if quite a few FB faculty from their country of origin are at the university because many of the FB women may not be professionals or even working because of visa issues if they entered the U.S. as wives of FB men faculty.

6. The pull of family and friends in the country of origin makes many FB faculty feel they are not at home either in the country where they were born or in the U.S.

Absence of extended family and the expense and time required for international visits often make it difficult for FB faculty to see their family and friends in their country of origin as frequently as they would like.

I think I put down more roots in the last five years than I had [earlier in my time in the United States].... Until then, honestly, I would have had to say probably more than 50 percent of my heart was still with...
the family in India... I [finally] found an emotional framework...that I didn't have to such an extent [earlier in my time in the United States. (Carrattini, 2013, p. 2)

FB women faculty from certain countries and cultures, where the expectation is that the women will foster close ties with the extended family, face a particular burden from such expectations.

A woman faculty member from Asia explained: They do come visit us and stay for a couple months every year. My parents love it in the U.S. and so far it has been good but it is a concern in the future when they are older and you know, need more care. What I should do but that’s something I haven’t quite figured out yet. (Lightner-Noll, 2021, p. 99)

Births, marriages, and deaths in the family, as well as holidays, exacerbate the feelings of estrangement from their extended family in the country of origin.

Discussion
The six findings above characterize experiences expressed by many FB women faculty from a variety of countries and continents of origin. Some of the literature revealed more subtle findings that applied to particular racial/ethnic groups from certain countries. For example, several noted disparities in the experiences of white FB faculty compared to faculty of color (Ghosh, 2015) from countries in the Caribbean (Hernandez, Nagunjirib, & Changa, 2015), Africa (Abla, 2012; Boafo-Arthur & Tsevi, 2021), and South Asia (Lawless & Chen, 2017) regarding discrimination and belonging. In some cases, tensions arose because of the institutional type, for example treatment of Black African vs African American faculty at HBCU’s (Afoaku, 2015; Ochukpue, 2004). In other instances, the institutional setting in terms of region of the U.S. (Afoaku, 2015; Xue, 2016), particularly in rural settings, contributed to increased discrimination for FB faculty of color.

Since very few of the studies focused on faculty from regional comprehensive (Roy, 2019; Oka, et.al., 2022; Lin, et al., 2009; Munoz, 2020) or two year institutions (Bista, 2016; Goodroad, 2019; Markus, 2011; Raby & Wells, 2007) (see column 5, Chart 1) it remains difficult to draw conclusions based upon Carnegie classification of institution, other than noting that FB faculty have increased dramatically beyond R-1 and R-2 institutions and liberal arts colleges where they predominated before the 21st Century. One issue that contributes to this relative understudy of FB faculty outside of research institutions is that much of the qualitative data is found in PhD dissertations (see column 3, Chart 1). Many of the students writing these dissertations study the populations present at the research institution where they are pursuing their degree.

Language, both written and spoken, becomes a significant issue for many FB faculty, particularly those from Asian countries. The written language can hinder research productivity, in terms of writing grants and publications; several faculty underlined the importance of collaborators or use of mentors (Canagarajah, 2018) that were native speakers to help with written English. Spoken English centers as a significant issue in teaching, often leading to poor student evaluations, complaints, and even students not signing up for courses if they know they will have a FB instructor (Alberts, 2008). Facility with spoken English may not suffice, as faculty from India and from England have noted student complaints in teaching evaluations about their accents. As indicated in one of the quotations about workload, concern over language and accent may also impact service due to inhibitions faculty impose upon themselves from speaking in meetings.
Policy Implications

The literature points to a number of policy and practice implications to improve the experiences of FB/FT faculty and enhance success and retention. Some of these policies pertain to higher education at the departmental, college, and institutional level. Other policies and practices are relevant on the national level, suggesting changes that federal agencies funding STEM might make, as well as current policies and practices of the federal government likely to influence the numbers of international students and faculty from certain countries such as China, likely to impact future STEM enrollments and workforce.

Suggested policies and practices for higher education institutions based upon findings from this study:

*Orientation:* Add issues and challenges that FB faculty may face as an aspect of new faculty orientation received by all new faculty, both FB and USB. This will not only facilitate the transition of FB faculty to institutions of higher education, but will provide USB faculty some insights into particular issues faced by their FB colleagues.

*Mentors:* Ensure that each FB faculty member has at least one mentor, including an individual who was FB and transitioned to become a faculty member in higher education in the U.S. A repeated recommendation that emerged from the literature (Bloom, 2017; Phillips, Dennison, & Davenport, 2016) was the importance of mentoring. Although mentoring is important for all new faculty, it becomes especially significant for FB faculty adapting to a new country and educational system. Ideally, a FB faculty would have more than one mentor, some who are USB and at least one that is FB.

*Immigration issues:* Provide help and guidance with immigration issues. In addition to a mentor to help guide the faculty member with immigration issues, having a university office that includes individual(s) with knowledge and expertise in immigration issues serves as a critical aid for this process. All deans and department chairs should also have some knowledge of immigration issues, at the very least knowing the individuals on campus with expertise to help and understanding the impact that immigration issues have on the FB faculty member’s progress towards tenure and promotion.

*Social isolation:* Recognize that FB faculty face the potential of social isolation and provide opportunities to increase their social interaction with colleagues. This becomes particularly crucial for women faculty who may be the only woman in a STEM department and may be excluded from informal networking and collaboration opportunities. Faculty on rural campuses located outside of large urban areas may face isolation from social opportunities and active discrimination, even if they feel included in the university.

Suggested recommendations that might be considered for policies and agencies of the federal government:

*For federal government agencies such as NSF:* The definition of URM needs to be overhauled for several reasons: First, it fails to include Asians and lumps all Asians from different countries together. As indicated in the section on definitions, NSF does not include Asians as URMs because when lumped together, they are overrepresented in STEM compared to their representation in the overall U.S. population. However, this overrepresentation often does not apply to Asian women in some fields such as computer science, subdisciplines of engineering, or economics. Also, lumping all Asian countries together fails to recognize that individuals from some Asian countries, such as the Hmong, are underrepresented in STEM.

When FB faculty become citizens or permanent residents, some individuals such as people from Spain are counted as Hispanic, while Blacks from Africa are counted as African American. Although such individuals
may have experienced racism in their home countries, it is not usually the same type of racism experienced by USB/UST African Americans and Latinx faculty. Counting such individuals as Hispanic or African American also distorts the data making it appear that more USB/UST individuals became faculty in STEM.

The definition of URM used by NSF should correspond with definitions used in the U.S. Census, where Asians are considered as a minority. In addition to being consistent with the U.S. Census, the definition of URM needs to be consistent across federal agencies. As discussed in the section on definitions below, for some work, the Environmental Protection Agency (EPA) and National Institutes of Health (NIH) use different definitions than those used by NSF, sowing confusion as to what constitutes a URM for federal purposes.

Federal policies and practices: Federal policies need to anticipate the future impacts of the China Initiative and other U.S. policies and political actions on STEM. As indicated previously in this report, the largest number and percentage of FB graduate students and FB/FT faculty currently come from China, with India and South Korea, ranking second and third in terms of numbers and percentages. The China Initiative begun under the prior administration has been documented to have disrupted the research and careers of several high-profile FB/FT faculty from the U.S. (Mervis, 2023; Quinn, 2023). The COVID pandemic decreased the numbers of international students seeking education in the US. Coupling this decrease with the current difficult and evolving political tensions between the U.S. and China suggests that the numbers of international students, especially from China, may not return to pre-pandemic levels. The impact of these policies and trends on undergraduate enrollment, graduate enrollment, and the STEM workforce, including academia, needs to be assessed and anticipated, including its uneven impacts across disciplines. Since over 70% of some U.S. departmental faculty in certain areas such as computer science and engineering are FB/FT, a significant drop in PhD graduates from China could lead to a major shortage of qualified STEM faculty in those disciplines.

Gaps and Areas for Further Research
The results of the analysis confirmed the relative understudy of the significant portion of FB women faculty who make up the academic STEM faculty in U.S. universities. In addition to neglecting this topic as an area for research in general, several aspects of the topic deserve particular focus and attention.

FB faculty in regional comprehensive universities and community colleges: As indicated earlier in this report, most of the research on FB faculty has focused on faculty in research institutions. Although initially and especially before the 21st Century, most of the FB faculty were concentrated in research institutions, this is no longer the case. Increasingly, FB faculty now have obtained tenure-track positions in regional comprehensive institutions and community colleges; in some departments and disciplines such as engineering and computer science, they constitute the predominant percentage of faculty in such institutions. Yet very few studies have focused directly on FB faculty in such institutions. While faculty in such institutions may be included in some studies, typically quantitative studies using large samples or data bases, often the data are not disaggregated in an intersectional way that yields results specifically for FB women faculty, especially women of color, in such institutions.

This focus on FB faculty at research institutions opens the possibility that some of the major findings surrounding FB faculty may not hold in environments outside of research institutions. For example, the finding the FB faculty tend to have higher research productivity may not be the case in institutions where the major criterion for initial hiring, as well as promotion and tenure, is not research. Similarly, the findings surrounding FB faculty production of fewer student credit hours may not occur in regional comprehensive and/or
community colleges where hiring and advancement of faculty are centered on teaching expertise, rather than research. Faculty in regional comprehensives and community colleges often also are unionized, depending upon the state and other contextual parameters; union contracts may constrict or impact in major ways the leeway permitted for variations in faculty workload assignment. More research on faculty in such institutions would clarify the issues for FB faculty in those environments and the extent to which they overlap or diverge from those of faculty in research institutions.

Disciplinary variations among FB faculty: Although the predominance of FB/FT faculty in certain disciplines such as engineering, computer science, and even physics and chemistry, has been noted, this predominance does not pervade all STEM areas. Tenure-track FB faculty are less prevalent in biology and life sciences, although they are quite prevalent as post-docs and research faculty in these areas. Although it is not uncommon for FB individuals to receive doctoral degrees in the social sciences from U.S. institutions, FB/FT faculty do not predominate in social science departments in U.S. institutions of higher education.

Impact of U.S. policies on future mixture of faculty currently predominant in STEM departments: As discussed in the section on policy implications above, federal policies need to anticipate the future impacts of the China Initiative and other U.S. policies and political action on STEM, since the largest number and percentage of FB graduate students and FB/FT faculty currently come from China.

Impact of COVID on careers of FB women faculty: Although some of the research coming out about the impact of COVID on women faculty in STEM indicates more research disruptions and fewer publications than those experienced by their male colleagues, to my knowledge no research has focused on the impact of COVID on FB women faculty compared to their USB women or men colleagues or FB male colleagues. In addition, it could be important to find out whether COVID made FB women faculty less likely to continue their careers in the U.S. or return to their home country of origin.

Career trajectories of FB women faculty: Much of the limited research on FB women faculty has focused on entry and mid-career FB women faculty. More research is needed to understand the experiences of FB women faculty and the mechanisms that enable their success as they mature in their careers and progress though the life span. These longitudinal studies will be especially salient as the influx of FB women in STEM from Asian countries increased dramatically when the immigration laws changed to allow more students from these countries to pursue graduate studies and remain in the U.S. to pursue employment.

Tension between FB women faculty and FB men faculty from same country of origin in the same department: Anecdotal information and rumors suggest that FB women faculty occasionally face discrimination based upon stereotypical expectations regarding gender roles from FB men faculty from their same country of origin. Although these FB men faculty may have learned not to place these expectations on USB women colleagues, they may continue to hold and enforce these gender-role expectations for their FB women colleagues. Research needs to be undertaken to understand whether these rumors and anecdotes are based in fact, since virtually no studies have explored this dimension of FB women faculty’s experience.

Hiring of FB couples in STEM departments: Although one article (Yabloksi, 2016) in this study focuses explicitly on the hiring of FB couples in STEM departments and a few other articles allude to this as an issue in retaining FB women, little research has focused specifically on this topic. Since this is a well-known issue in
the literature on USB women in STEM, this needs to be explored to understand better the differences between FB and USB faculty on this topic.

**Limitations**

*Truly intersectional data that focuses on race/ethnicity on FB women faculty and comparisons with FB men faculty and USB faculty is very limited.* As indicated earlier, applying all initial key words of FB OR international OR immigrant AND women OR gender AND STEM AND URM OR race/ethnicity in combination yielded no or 1-2 results in virtually all searches. The fourth field of URM or race/ethnicity was especially problematic, as most of the research on FB faculty lumps all races/ethnicities together. In some instances, race/ethnicity is treated as a variable, but it is not then intersected with gender or FB status in analyses. Several of the 30 articles reported on in the final survey include only three of the key word fields.

*Small sample sizes that characterize the majority of qualitative studies limit the generalizability of results to broader populations.* For example, some of the studies have as few as five subjects. The generalizability becomes further limited by fact that several of the studies only focus on women from one country such as China or India. In one case (Lightner-Noll, 2021) the study was of nine women faculty in STEM from China of Confucian belief; generalizing the results of this study to a broader population would not be appropriate. *Bias in information about FB women faculty may likely result from the relatively larger number of qualitative studies that have focused on women from China and India.* Increasing numbers of women from Middle Eastern countries are represented in STEM departments in the U.S., but little research has focused on these women, who may face discrimination based upon religion, particularly if they wear head coverings, and are perceived as possibly being connected to terrorists.

*Methodological choices and decisions I made may have limited the study.* The decision not to use a software tool such as Nvivo to code the studies has pros and cons. I came up with themes after reading both the 58 quantitative and 41 qualitative articles closely and carefully and using a template guide for note taking and developing tags, providing me with considerable familiarity with the data and allowing the themes to emerge somewhat organically. Although the inclusion dates of 2001—2021 were reasonable, given that those dates encompassed two decades of literature and that the study began in August 2022, it did mean that two major factors likely to greatly impact FB women faculty were not included in the study. Neither the impact of COVID nor the impact of the U.S. China initiative and other current U.S. political policies upon current or future FB faculty in the U.S. were included. I included quantitative articles in the initial literature survey, despite the fact that they were in the exclusion criteria, but the final report focuses only on the literature with qualitative data, including some with mixed methods, because the goal of the project was to understand the experiences of FB/FT women faculty through the intersectional lenses of race and gender.

**Definitions**

Since researchers may vary in their use of terms such as foreign-born, STEM, URM and intersectionality, I define the ways in which these terms were used in this study and this report:

*Foreign born/Foreign trained faculty (FB/FT):* Although often used interchangeably with immigrant faculty or international faculty or even diaspora faculty, the preferred term according to Akuli (2015) now most commonly used in the literature is foreign born/foreign trained faculty.
Underrepresented minorities (URM): This study and this report use the NSF definition of underrepresented minorities: “Races or ethnicities whose representation in STEM employment and S&E education is smaller than their representation in the U.S. population. This includes Blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives”. (NCSES, 2023).

This definition of URM differs from that used by the U.S. Census Bureau in their diversity index of race/ethnicity which includes Asians (U.S. Census Bureau, 2021). It also differs from that used by some other government agencies such as the Environmental Protection Agency (EPA) (Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts, 2021) when defining vulnerable populations or NIH when defining underrepresented populations in clinical research (Minority Health and Health Disparities: Definitions and Parameters, NIH, 2022).

Science, technology, engineering, and mathematics (STEM): This study and this report use the NSF definition of STEM, which includes many of the social sciences such as economics, sociology, anthropology, psychology, geography, as well as linguistics, and many interdisciplinary fields such as science and technology studies, decision and risk management sciences. Clinical fields are excluded.

Intersectionality: This study and report are framed to be congruent with the NSF recognition and definition of an intersectional perspective: (ADVANCE Brochure, 2021-50). FB/FT status is a social identity, along with gender and race/ethnicity, that is more salient in this study and report. (see Limitations section for further discussion of intersectionality).

Communication of Results of this Study
The second goal of this project was to communicate the results of this metasynthesis to FB/FT and USB/UST faculty, scholars to research the gaps in knowledge, and administrators to improve the work environment. To date, I have presented the results to the following groups in an attempt to reach faculty, administrators, NSF program officers, and policy makers on the state, national, and international level: Two presentations to the California State University (CSU)—Fresno KIND ADVANCE Partnership leadership team; one presentation to the External Advisory Board of the CSU—Fresno KIND ADVANCE Partnership grant; separate presentations to 23 California State University (CSU) Science Deans and to Engineering Deans; presentation at the international conference ATLC 2023: Innovation and Policy in Science and Technology, Atlanta, GA, and a presentation to the ARCs Convening, Duke University. In addition to future presentations, I intend to seek one or more publication outlets for the study results.
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As the STEM equity brain trust, the ARC Network promotes systemic change by producing new perspectives, methods, and interventions with an intersectional, intentional, and inclusive lens. More at EquityInSTEM.org


Appendix 1: List of Studies Included in the Analysis


Young, Monica J. (2012). Engineering a place for women: A study of how departmental climate influences the career satisfaction of female mechanical engineering faculty members. Dissertation. Syracuse University. [https://surface.syr.edu/tl_etd/240](https://surface.syr.edu/tl_etd/240)

Appendix 2: List of Qualitative Studies Assessed for Eligibility but Excluded from Meta-synthesis


Asher, Nina. (2010). How does the postcolonial, feminist academic lead? A perspective from the US South. International Journal of Education, 13(1): 63-76. DOI:10.1080/13603120903242915. To link to this article: https://doi.org/10.1080/13603120903242915


Appendix 3: List of Quantitative Studies Assessed for Eligibility but Excluded from Meta-synthesis


Bista, Krishna. (2016). Faculty international experience and internationalization efforts at community colleges in the United States. In International Education at Community Colleges R.I Raby and E.J. Valeau (Eds.)


Huang, Carol. (2019). America’s Higher Education: My Journey as a Taiwanese Immigrant Woman Faculty. De Gruyter. Multicultural Learning and Teaching. 20192027

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Mamiseishvili, Ketevan. (2013). Contributions of Foreign-Born Faculty to Doctoral Education and Research. New Directions for Higher Education, no. 163, Fall © Wiley Periodicals, Inc. Published online in Wiley Online Library (wileyonlinelibrary.com) DOI:10.1002/he.20068


As the STEM equity brain trust, the ARC Network promotes systemic change by producing new perspectives, methods, and interventions with an intersectional, intentional, and inclusive lens. More at EquityInSTEM.org


Nakamura, Mayuko. (2019). Working With Faculty of Color at a Predominantly White Institution: Challenging Whiteness and Model Minority Stereotypes. New Directions for Teaching and Learning, no. 158, Summer 2019 © Wiley Periodicals, Inc. Published online in Wiley Online Library (wileyonlinelibrary.com) • DOI: 10.1002/tl.20338


Smith, Daryl G., Tovar, Esau, & Garcia, Hugo A. (2012). *Where Are They? A Multilens Examination of the Distribution of Full-Time Faculty by Institutional Type, Race/Ethnicity, Gender, and Citizenship.* *New Directions for Institutional Research*, no. 155, Fall 2012 © Wiley Periodicals, Inc. 5. Published online in Wiley Online Library (wileyonlinelibrary.com) • DOI: 10.1002/ir.20019


Wells, Ryan. (2007). *International Faculty in U.S. Community Colleges.* *New Directions for Community Colleges*, no. 138, Summer © 2007 Wiley Periodicals, Published online in Wiley InterScience (www.interscience.wiley.com) • DOI:10.1002/cc.284

Appendix 4: Categories for template guide for note taking (with tags for subthemes)

Type of publication
  (dissertation or article)
Year published
Peer review
  (committee, peer review or chapter)
Type of institution
  (R-1, R-2, MA PWI, HBCU, not specified, teaching, 2 year, community college, university, all types)
Method used in study
  (qualitative interview, mixed, review article)
Disciplines or fields
  (multiple, geography, mechanical engineering
Primary discipline
  (STEM+, STEM, Geography, not especially STEM, all STEM, ME only)
Foreign born vs US born
  (yes; no)
Gender
  (Both, women) *note that men only articles were excluded)
FB men vs FB women
  (no, yes, n/a)
FB women vs USB women
  (no, yes)
Race/URM
  (yes, no, Chinese, not really, Asian, African American/African, African American/Asian)
Workload—teaching
  (some, focus, minor, yes, no)
  (language—for some, focus, some, yes, minor, o)
  (production of student credit hours)
  (student discrimination)
  (evaluation)
Workload—research
  (compete, publish, focus, n/a, some, minor, major, yes, some)
  (difficulties obtaining collaborators and visibility)
  (ineligibility for some funding)
Workload—service
  (leadership, n/a, some, yes, minor, focus)
  (different, less important committee assignments)
  (stereotypical gender roles and cultural expectations for FB women)
Immigration
  (transition, touch, n/a, some, yes)
Pull of country of origin vs US
  (international travel, African American vs African, n/a, some yes, both ways, focus, dual career)

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