Prioritizing diversity in *in-vitro* models for basic SARS-CoV-2 research

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**COVID-19 and minority groups**

The current COVID-19 pandemic, caused by the SARS-CoV-2 virus, has disproportionately impacted racial and ethnic minority groups in the United States. Those in minority groups are more likely to be infected, develop more severe symptoms, and die from the disease compared to white, non-Hispanic individuals (figure 1). This disparity may be linked to socioeconomic status, access to health care, underlying health concerns, inconsistent knowledge dissemination, and other factors that may or may not be biological in nature (1,2,3,4). Regardless of the reason of the discrepancy, researchers should prioritize the use of diverse *in-vitro* models that represent ethnic and racial minorities in SARS-CoV-2 research.

**Minority groups in research**

The racial discrepancies of this disease have highlighted a longstanding need to increase diversity in model systems used in basic biological research. The reliance on cell lines obtained from white males of European descent has resulted in a dearth of knowledge regarding specific impacts of this disease, and other diseases, on racial and ethnic minority groups. These groups are often intentionally excluded from genomic association studies due to the potential for introducing additional variables and confounding data (6,7).

*In-vitro* SARS-CoV-2 studies rely on common viral permissive cell lines including Calu-3, HEK293, Caco-2, HUH7, and U251 cells all of which, except for Huh7, originate from Caucasian individuals (8). Although cell lines from minority groups exist, they are less frequently used due to limited development and poor characterization. A notable exception is the widely used, ethically fraught, HeLa cell line, which was taken without consent from an African American woman (8).

The inclusion of minority groups in cell based models can provide valuable information about disease pathology and response to therapeutics that might otherwise be overlooked. Additionally, it may increase trust in basic research in diverse individuals, spark greater interest and participation in STEM fields, and help right some of the social injustices perpetrated against these groups (9).

**Proceeding with caution**

Recognizing the need to increase use of cell models obtained from minority groups is not a sufficient step forward unless it is accompanied by an increase in diversity, equity, and inclusion in research topics and academic roles. Researchers must also be wary of how racial and ethnic data is displayed and interpreted to the public to prevent the spread of misinformation and misinterpretation of possible differences as racial inferiority/superiority.

**Moving forward**

Embracing minority groups in biological research will fill essential knowledge gaps regarding population specific responses to SARS-CoV-2 as well as provide a structured framework for studying other diseases through the lens of diversity and inclusion. Even if the disproportionate effects of this virus are not biological in nature, the use of minority models will hopefully catalyze a positive change in how researchers view and treat race and ethnicity in individuals and in experiments.

**Literature cited**

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Beyond Culture Competence: Applying Cultural Humility in Higher Education
Prepared by Cherterickia Davis, MSW, MPA

Why Not Culture Competency?
Culture competence as we know it promotes skill building to understand minority cultures to better and more appropriately provide services. However, it implies there is a distinct endpoint in knowledge—meaning once we learn or gain knowledge on a culture aspect, that is it.

- Focus on achieving culture-specific attitudes, knowledge, and skills
- Assume competence in other cultures is achievable
- Frames culture as monolithic
- Deduce culture to an academic study

Cultural humility is a lifelong process of self-reflection, self-critique and commitment to understanding and respecting different points of view, and engaging with others humbly, authentically and from a place of learning (Tervalon & Murray-Garcia, 1998).

What is Cultural Humility?
Cultural humility is having a respectful attitude toward individuals and their cultures. It pushes one to challenge their own cultural biases while realizing they cannot possibly know everything about other cultures. It approaches learning about different cultures as a lifelong objective.

Cultural humility was formed due to the shortcomings of cultural competence. Some professionals, like social workers, doctors, and teachers, believed themselves to be culturally competent after learning generalizations of a particular culture. Cultural humility encourages active participation to learn about an individual’s personal cultural experiences.

Cultural Humility In Higher Education
As a professor/student/staff at a public university you can...
- Participate and apply racial equity training
- Study the history of race and racism in the U.S. and understand how it disproportionately impacts BIPOC
- Collect and analyze data about the university’s practices, programs, services, and community partnerships through an equity lens
- Learn to develop and evaluate culturally relevant and appropriate programs, materials, and interventions

The Three Facets of Cultural Humility

Self-Reflection
- Cultural humility suggests remaining humble and aware of your own deficient knowledge of other cultures.
- It’s important to be okay with not knowing everything.
- Challenge your assumptions, judgments, and prejudices.

Critique Power Imbalances
- Cultural humility encourages people in places of power to acknowledge their privilege and how it can provide better opportunities.
- It encourages experts to become students when interacting with individuals of other cultures.
- The goal is to collaborate and devise the best solutions for the [student’s] situation.

Promoting Institutional Accountability
- Cultural humility encourages professionals to reach out to advocacy groups on a systematic level.
- Sharing the knowledge and value of cultural humility on a larger scale is vital in ensuring that other individuals participate.
- This is a lifelong process for institutions as well; they are required to constantly review policies and update accordingly.
A Cross Section Between Race and Gender in Telework: Are There Disparities in Diversity and Inclusion Policy?

INTRODUCTION

Telework falls under Diversity and Inclusion policies in federal organizations. Compared with a plethora of studies that have been supporting the wage gap between race and gender, inequality of an opportunity of approaching diversity and inclusion policies among them has relatively less studied so far. The research explores the inequality of telework eligibility and participation between different attributes.

Social Construction and Target Population (Schneider & Ingram, 1993; Schneider & Sydney, 2009)

Based on the social construction and target population theory (Schneider & Ingram, 1993; Schneider and Sidney, 2009), some social groups are positively constructed in a policy area, meanwhile, other social groups are less supported. Applying telework policy into the mechanism, the social image of the females would be positively constructed since the policy aims to achieve a balance between work and life. On the other hand, the benefits of racial minority groups are likely to be undersubscribed due to the week political power and social image.

RESULTS

<table>
<thead>
<tr>
<th>Eligibility Rate (%)</th>
<th>Observed Frequency</th>
<th>Sample</th>
<th>Participation Rate (%)</th>
<th>Observed Frequency</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>80.98</td>
<td>134,897</td>
<td>Model 1</td>
<td>76.39</td>
<td>121,865</td>
</tr>
<tr>
<td>Male</td>
<td>73.97</td>
<td>143,003</td>
<td>Model 2</td>
<td>66.86</td>
<td>122,884</td>
</tr>
<tr>
<td>Racial Minority</td>
<td>78.78</td>
<td>86,808</td>
<td>Model 3</td>
<td>72.92</td>
<td>76,479</td>
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<tr>
<td>Racial Non-Minority</td>
<td>76.49</td>
<td>182,539</td>
<td>Model 4</td>
<td>70.74</td>
<td>160,727</td>
</tr>
<tr>
<td>MinorFemale</td>
<td>80.77</td>
<td>128,477</td>
<td>Model 5</td>
<td>76.17</td>
<td>116,193</td>
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<tr>
<td>MinorMale</td>
<td>73.84</td>
<td>137,413</td>
<td>Model 6</td>
<td>66.75</td>
<td>118,175</td>
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<tr>
<td>Non-minorFemale</td>
<td>80.2</td>
<td>79,213</td>
<td>Model 7</td>
<td>75.73</td>
<td>71,876</td>
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<tr>
<td>Non-minorMale</td>
<td>73.52</td>
<td>101,172</td>
<td>Model 8</td>
<td>66.58</td>
<td>87,065</td>
</tr>
</tbody>
</table>

Notes: a. b. indicate the frequency of the cell. c. All 8 models are statistically significant by the Chi-Square Test.

DATA and METHOD

Data:
The 2015 Federal Employee Viewpoint Survey by the Office of Personnel Management

The survey population for the 2015 FEVS included full- and part-time, permanent Federal employees. The 2015 sample included 37 departments and large agencies as well as 45 small and independent agencies. The number of completed surveys is 421,748 (response rate of 49.7% total eligible employees 903,060). The final sample of the research is 277,900 of the respondents who indicated their telework eligibility and status.

Method: Cross Tabulation Analysis

With the SPSS 26, the Chi-Square test was utilized to analyze the correlations between discrete independent (gender and racial minority) and dependent variables (telework eligibility and participation) of the eight research models.

CONCLUSIONS

Results of the research
1. Generally, the telework policy was more favorable for female employees in Federal governments. The gap between Genders in telework participation was more conspicuous than that of telework eligibility.
2. A Racial Minority factor had less influence on the telework eligibility and participation than Gender had. Dislike the hypothesis, racial minority has not negative impact on telework eligibility and participation.
3. In terms of the intersection between gender and race, over 75% of racial minority and non-minority females teleworked, whereas about 66% of racial minority and non-minority males did.

Discussions
1. Reflecting on the social construction and target population theory, the social image of female employees would be more favorably constructed in the telework policy. In line with that, the organizations may implement a flexible work arrangement for females.
2. For future research, we need to explore whether organizations/supervisors regard females have a more responsible for the balance between work and life, whereas males have more responsible only for work.

Key References
Since COVID-19, educators are being charged with innovation, creativity, and technological savviness. All these things become secondary if ignorance about the visual disclosures of virtual classrooms are overlooked. These disclosures occur as videos are shared displaying intimate details of student’s lives. “T.E.A.C.H. me” uses depictions of Zoom classes to spark discussions on how to navigate virtual classrooms professionally without inadvertently exposing socio-economic differences and sacrificing virtual participation.
Transforming Virtual Spaces to Actively Challenge the Dominant Discourses of Oppression in Online Learning

Darren Gaddis, Elizabeth Gilliam, and Inika Williams

Purpose

Dominant discourses impact students at all educational levels, from the earliest childhood courses to the highest towers of higher education. What are often considered to be best practices often "promote an idealized vision of 'the student body' or the 'traditional' student that is limited to those who are white, cisgender-heterosexual men, 18-23 years old, middle to upper class, enabled, and Christian" (Stewart & Nicolazzo, 2018, p. 135). While all are familiar with narratives that center these experiences, many teachers and students miss out on the chance to learn from and experience stories and lessons that both center and expand on their diverse perspectives. As new definitions and understanding of diversity continue to emerge and evolve, so shall our responses to their presence. As a leading institution in research and education, Florida State University must work to ensure all student experiences and concerns are considered, included, and addressed during their time in our community.

Approach

Through an interdisciplinary review of the literature offering a thorough view of the concerns coming to light in higher education, we will present a clear view of how institutions of higher education can transform virtual spaces in ways that would actively challenge dominant discourses of oppression. While discussions of equity and equality, as well as the promotion of terms like diversity and inclusion have granted institutions the appearance of carefully curated acceptance on campus, exploration into such considerations in distance learning spaces is steadily emerging. The campus, exploration into such considerations in appearance of carefully curated acceptance on diversity and inclusion have granted institutions the equality, as well as the promotion of terms like oppression, heterogenderism, and settler colonialism.” (Stewart & Nicolazzo, 2018, p. 134)

While instructors can encourage students to turn on their cameras, students should also be given a choice to do so. Considering students who may not have the privilege of having a dedicated working space at home or maybe uncomfortable or embarrassed by their surroundings, students can be offered an alternative to upload a picture or a selfie, or add a filter or background to their web cameras. Assess the temperature before the start of class. This can be done by through a Kahoot or Zoom survey, via e-mail, or another one of the many online engagement tools. This helps faculty convey a stance of support and concern for students’ well-being.

Consideration needs to be given to sexuality and gender norms which have been used to historically exclude those with minoritized sexual and gender identities. (Collins, 1998, 2004; Stewart & Nicolazzo 2018)

White is connected to other discourses of oppression which can include gender, sexuality, and social class.

White is “distinct from white identity and white supremacy.” (Stewart & Nicolazzo 2018, p. 134)

Discussion

White in the form of an idea is built upon and supported by the foundations of “racism, patriarchy, classism, ableism, ageism, religious hegemony, trans* oppression, heterogenderism, and settler colonialism.” (Stewart & Nicolazzo, 2018, p. 134)

Maintaining our place in conversations in higher education during the days of COVID-19, we must be sure to focus on our students’ lives before college, perhaps now more than ever. Polikoff (2020) found that many students in secondary grades struggled with distance learning, feeling that they weren’t receiving the support they needed. Students are also contending with issues of internet connectivity and challenging living situations.

It is imperative that privileges are understood and recognized, not demonized nor shied away from. Privilege grants one groups access to something of value that other groups lose access to. This lost access is not because of anything they have or have not done, but simply comes down to group membership (Johnson, 2013).

The responsibility for any institution of higher learning to regard, respect, and respond to students of different groups is to honor these differences, while also recognizing the potentially harmful circumstances that have created and upheld many of these differences. While differences are not the sum of the person, they have very real constructions in society that have impacts on everyday life (Johnson, 2013).

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Future Discussion

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Build community through embed icebreakers or “getting to know you” activities into the course so both asynchronous and synchronous students can participate.

Create class rituals that build community. Students can spend the last few minutes sharing a meaningful quote or one positive thing that happened to them that week.

Engaging in whiteness is not only exclusive to those who are classified as white. (Stewart & Nicolazzo, 2018)

References


Nicandro, V., Khandelwal, A. K., & Weitman, A. W. (2020, June 2). Please, let students turn their videos off in class. The Stanford Daily


Marine Science Laboratory Alliance Center of Excellence

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¹Mote Marine Laboratory, ²College of the Florida Keys, ³State College of Florida

THE LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION: MARINE SCIENCE LABORATORY ALLIANCE CENTER OF EXCELLENCE (LSAMP MARSCI-LACE), established Sep. 1, 2019, is led by Mote Marine Laboratory: an independent, nonprofit, marine research institution with a unique model for translating real-world STEM (science, technology, engineering and math) discoveries for direct educational impact.

By leveraging the unique scientific resources, exceptional staff and innovative, entrepreneurial culture that define independent marine research institutions (IMRIs), MarSci-LACE will implement a new paradigm for increasing underrepresented minority student success in marine STEM.

MarSci-LACE is in Phase 2 of a three-year project.

Marine STEM fields are among the least ethnically diverse across all STEM fields. There is a need for innovative recruitment, retention and support efforts of underrepresented minority students in marine STEM. IMRIs play an essential role in providing students with opportunities to enhance their academic coursework through intensive research experiences, career skill development and mentorship from professional scientists. MarSci-LACE will create collaborations and partnerships between academic and independent research institutions to increase underrepresented minority (URM) student participation in marine STEM.

**Intern Alliance**

- Interns received hands-on research experience and participated in weekly professional development meetings based off of the Entering Research Curriculum.
- Topics covered: building a successful application, networking, presenting research, reading scientific papers and using your assets to succeed.
- Interns attended a Career Panel and Graduate Student Panel of URM marine scientists.
- Pre/Post surveys indicated increased confidence in several areas in addition to an increased sense of belonging and science identity.

**Mentor Alliance**

- The Mentor Alliance began with a three-part mentor training series based off of the Entering Mentoring curriculum, which is designed to pair with the Entering Research curriculum.
  - Session 1: an overview of what mentorship is and why it's important.
  - Session 2: tools and tips to be an intentional mentor.
  - Session 3: culturally aware mentoring.
- Session 3 featured guest speakers from the Gainesville Ally Network that taught an Ally 101 course based on the Frame Shift curriculum.
- Mentors showed growth in several areas according to the pre and post assessments. Mentors enjoyed the program so much that they requested continued monthly meetings.

**Next Steps**

- Evaluate the summer internship program.
- Design and implement refined internship program.
- Expand summer internship program to include partner marine laboratories.
- Complete and analyze interviews with URM marine scientists.
- Design and implement an expanded mentor training program.
- Collect and distribute additional student and mentor resources.
- Conduct further research and collect data around how URM students are participating in research experiences in marine science.
- Develop methods to transfer innovative strategies and best practices to other IMRIs and LSAMP institutions.

**Sources:**

- Total degrees earned in marine disciplines
- 17.5% earned by URM students

**NEED**

**OBJECTIVES**

- Collect, inventory and categorize all existing URM participation and efforts at IMRIs.
- Design and implement assessments of student experiences, mentor perspectives, and institutional efforts related to URM at IMRIs.
- Collect existing and develop new resources for URM students, mentors and institutions to improve research experiences at IMRIs.
- Facilitate the transfer of research based best practices and resources widely to prospective and current URMs, mentors, IMRIs, LSAMP institutions and other interested parties.

**YEAR 1 CASE STUDY**

**PARTNERS & ACKNOWLEDGEMENTS**

This project was made possible with support from NSF LSAMP and INCLUDES grant number #1922351.
Promoting Diversity in 2-year STEM Faculty: A Regional Change Model

Spirit Karcher\textsuperscript{1,2}  Anthony Jones\textsuperscript{3}  Erica Staehling\textsuperscript{1}

\textsuperscript{1}Office of STEM Teaching Activities, Florida State University  \textsuperscript{2}Mathematics Education, Florida State University  \textsuperscript{3}Division of Science and Mathematics, Tallahassee Community College

The purpose of the Aspire Alliance Florida Regional Collaborative (FLRC)...

- Increase the number and diversity of the pool of graduate students and qualified professionals pursuing a teaching career in STEM at 2-year colleges;
- Expand and strengthen the skills of future, early-career, and current STEM faculty to teach the diverse student population.

Potential FLRC Activities

We currently have a planning grant to develop the FLRC by building community connections and seeking collaborators and input from both within our own institutions, as well as across the state of Florida.

- Support mentored practicum experiences for STEM graduate students to teach at 2-year colleges

Two such internship programs exist in our region:

1. FSU/TCC College STEM Teaching M.S. Program
2. UF/Santa Fe Faculty Development Project

Other potential activities...

- Professional development workshops for 2-year and 4-year STEM faculty and graduate students on equitable/inclusive teaching practices
- General research-based teaching practices
- Discipline-specific research-based teaching practices

- Faculty panels/"Visit Days" at local 2-year colleges to introduce STEM graduate students to community college career options

- Monthly newsletters covering topics such as research-based teaching practices, equity and diversity in STEM, FLRC updates, current trends/events in STEM education, and more.

...your additional ideas? We would love to hear from you and get more people involved!

Interested in getting involved with the FLRC? Contact Us!

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Anthony Jones (Co-Lead)  jonesa@tcc.fl.edu
Spirit Karcher (Program Coordinator)  sk18f@my.fsu.edu

Why focus on 2-year STEM Faculty?

Florida State University System Enrollment by Student Type

- Nearly 28% of students enrolled in the Florida State University System have transferred from a 2-year college
- Non-STEM transfer students may only take STEM courses at the 2-year college level
- STEM transfer students typically take foundational courses in their major (e.g., biology, chemistry, college algebra, calculus) at the 2-year college level

Local “Pipeline” of STEM Pathways

FLRC aims to support retention of minority students along this pipeline.

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- STEM transfer students typically take foundational courses in their major (e.g., biology, chemistry, college algebra, calculus) at the 2-year college level