

# **Title: Investigating the Role of Gender Stereotypes in Undergraduate STEM Fields**

## **1. Introduction**

1.1. Background: Despite efforts to increase diversity in Science, Technology, Engineering, and Mathematics (STEM) fields, gender disparities persist, particularly in traditionally male-dominated disciplines. Gender stereotypes may contribute to these disparities by influencing students' academic experiences, self-efficacy, and career aspirations.

1.2. Research Question: How do gender stereotypes affect the academic experiences and career aspirations of undergraduate students in STEM fields?

1.3. Importance of the Research: This research will provide insights into the challenges faced by underrepresented genders in STEM fields, inform policy changes, and intervention strategies to promote gender diversity in these disciplines.

## **2. Literature Review**

Existing literature has explored various aspects of gender stereotypes in STEM fields, including stereotype threat, implicit biases, and the impact on students' self-efficacy and career choices. However, there is limited research focusing specifically on the experiences of undergraduate students in STEM majors, particularly in relation to gender stereotypes.

## **3. Research Objectives and Hypotheses**

3.1. Research Objectives:

- To examine the prevalence of gender stereotypes among undergraduate students in STEM fields.
- To explore the impact of gender stereotypes on students' academic experiences, self-efficacy, and career aspirations.

3.2. Hypotheses:

- H1: Gender stereotypes are prevalent among undergraduate students in STEM fields.
- H2: Exposure to gender stereotypes negatively affects students' academic experiences, self-efficacy, and career aspirations in STEM disciplines.

## **4. Methodology**

4.1. Research Design: A mixed-methods research design will be employed, combining quantitative surveys and qualitative interviews to explore the role of gender stereotypes in undergraduate STEM fields.

4.2. Data Collection Plan:

- **Quantitative Surveys:** A sample of undergraduate students in STEM majors will be recruited to complete an online survey assessing their experiences with gender stereotypes, academic experiences, self-efficacy, and career aspirations.
- **Qualitative Interviews:** A subset of survey participants will be invited to participate in semi-structured interviews to provide more detailed insights into their experiences with gender stereotypes in STEM fields.

#### 4.3. Data Analysis Methods:

- **Quantitative Data:** Descriptive statistics, correlation analyses, and multiple regression analyses will be conducted to examine the relationships between gender stereotypes, academic experiences, self-efficacy, and career aspirations.
- **Qualitative Data:** Thematic analysis will be employed to identify common themes and patterns in interview data related to students' experiences with gender stereotypes in STEM fields.

### 5. Variables

#### 5.1. Independent Variable:

- **Gender Stereotypes:** Perceptions and experiences of undergraduate students regarding gender roles and expectations in STEM fields.

#### 5.2. Dependent Variables:

- **Academic Experiences:** Students' perceptions of their academic success, classroom experiences, and support from faculty and peers in STEM fields.
- **Self-Efficacy:** Students' beliefs in their capabilities to succeed in their chosen STEM major.
- **Career Aspirations:** Students' intentions to pursue careers in STEM fields.

### 6. Implications, Limitations, and Practical Applications

6.1. **Implications:** This research will contribute to a better understanding of the role of gender stereotypes in shaping academic experiences and career aspirations among undergraduate students in STEM fields. The findings may inform interventions aimed at reducing the impact of gender stereotypes on students' success in STEM disciplines.

#### 6.2. Limitations:

- The study's findings may not be generalizable to other populations or settings.
- The reliance on self-report measures may introduce bias and limit the accuracy of the findings.

6.3. **Practical Applications:** Educators, institutions, and policymakers can use the findings of this research to develop strategies for addressing gender stereotypes in STEM fields, creating inclusive learning environments, and encouraging underrepresented genders to pursue careers in these disciplines.