

A Qualitative Study of STEM Student Motivation to Attend Supplemental Instruction, In-Person | Online

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Statement of the Problem

What student perceptions that are barriers that prevent them from attending Supplemental Instruction/Online Supplemental Instruction (SI/OSI) study sessions?

The demand for students skilled in the areas of Science, Engineering and Mathematics exceeds the supply of students educated to work in these fields. A deficit of STEM graduates is expected to be in the millions based on a report from the President's Council of Advisors on Science and Technology (PCAST) (Carver et al., 2017).

Limited participation of minority students in STEM education is a concern as minority representation in the field is not representative of the public.

Research Questions

1. What is the relationship of the demographic variables with engagement in SI/OSI?
 - a. How aware are students of SI/OSI?
 - b. How do students become aware of SI/OSI?
 - c. How do students plan, schedule mediate conflicts, regarding SI/OSI attendance?
 - d. What preference do you have for SI or OSI and why?
2. What motivates students to attend or not attend SI/OSI?
 - a. Are advantages to SI and OSI perceived differently?
3. What are the perceived advantages or disadvantages of participating in SI/OSI?
 - a. Are advantages to SI and OSI perceived differently?
4. How do SI/OSI experiences impact outcomes and related retention of students in science and mathematics courses.

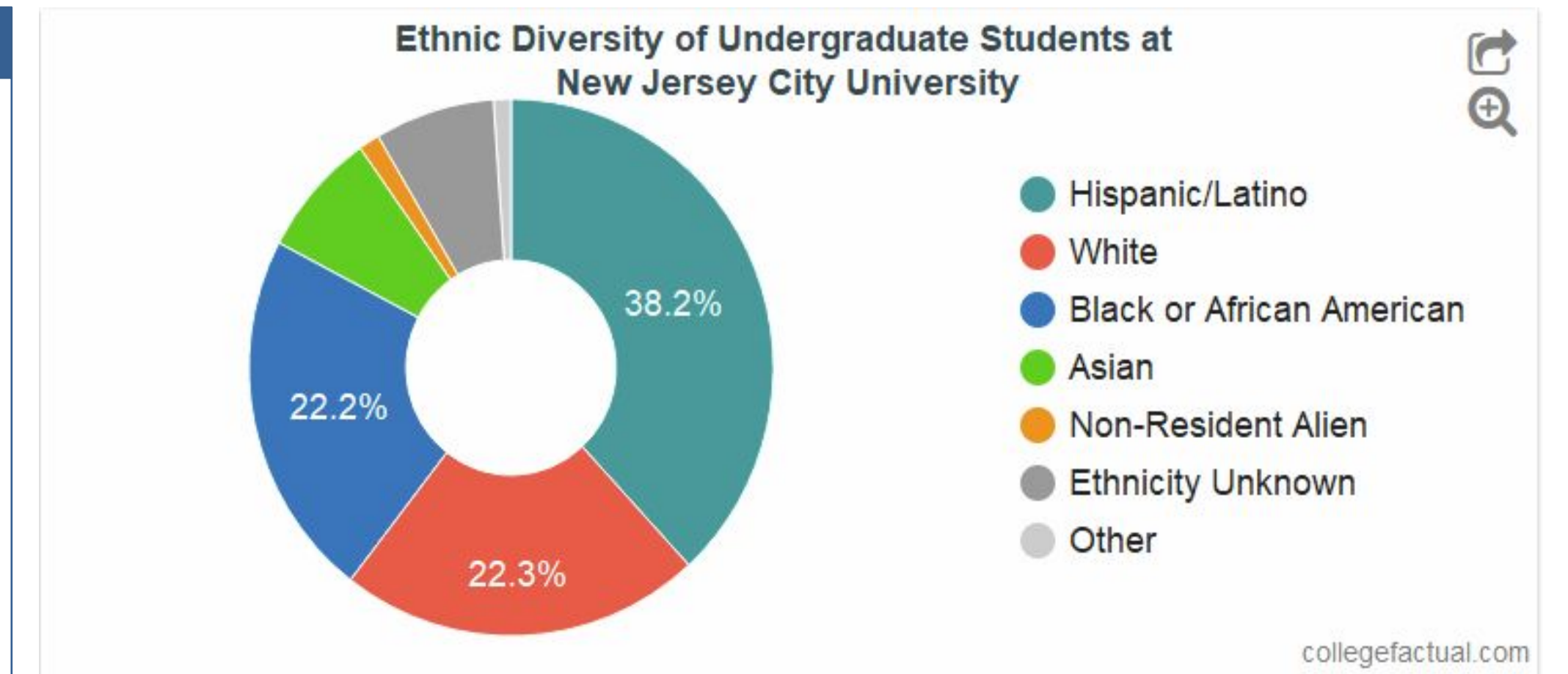


Figure 3

Introduction

Peer facilitated support for traditionally difficult courses has helped students master STEM content and has helped higher education institutions retain STEM students (Malm, Bryngfors, Morner & LiseLotte, 2010).

Research shows that supplemental instruction, in-person and online, improves outcomes and retention for STEM students (Skoglund, Wall & Kiene, 2018).

Supplemental Instruction (SI) was developed at the University of Missouri-Kansas City. It was initiated in the 1970's as a support system to meet the needs of increasing diversity among students in higher education. One of the goals is to guide students in the use of effective study strategies (Martin, D. & Arendale, D., 1992)

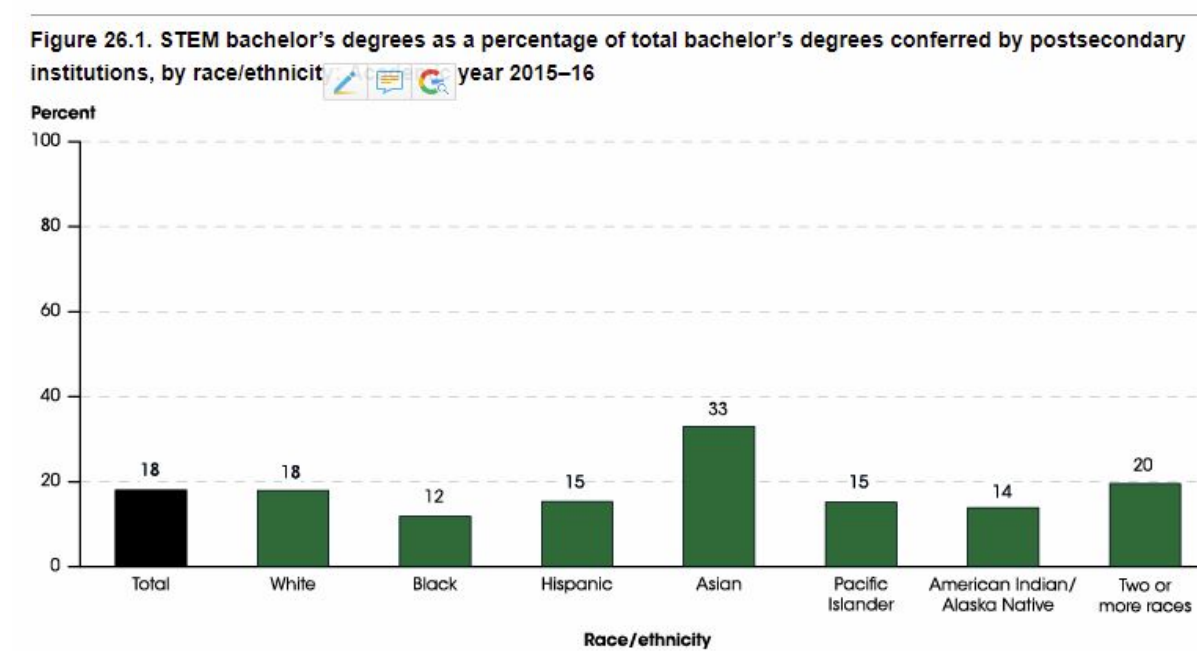


Figure 1

Methods and Instruments

This is a qualitative study of student motivation to attend or not to attend Supplemental Instruction/Online Supplemental Instruction (SI/OSI) study sessions.

A survey will be used to request/confirm consent and gather demographic variables.

A sample of students will be interviewed using a researcher created open-ended questionnaire using questions modified from the Modified Learning Survey Questionnaire (MLSQ) Pintrich, Smith, Garcia & McKeachie, (1991).

A Focus Group will be interviewed using a researcher created open-ended questionnaire.

Students will be observed during a supplemental instruction session. Data will be recording using an instrument created by the researcher.

Data Collection

Purposeful sampling will be used to identify students willing to participate from PreCalc, Calc, and Chemistry courses. Supplemental Instruction sessions are offered for these courses.

These courses are selected as they are courses that historically have low SI attendance and a larger percentage of students with grades that would be categorized as unsuccessful.

Data Analysis

Data will be coded to identify:

- Categories of student perceptions
- Themes
- Concepts
- Labels to identify areas of interest.

Data Analysis research software will be used to assist transcription and coding after the initial coding.

Figure 2

ACCESS		What kind of students attend New Jersey City		
		AMONG THE LOWEST	ABOUT TYPICAL	AMONG THE HIGHEST
Median family income	\$42,200	■	□	■
Average income percentile	47th	■	□	■
Share of students from top 0.1%	<1%	□	□	□
...from top 1%	<1%	■	□	■
...from top 5%	<1%	■	□	■
...from top 10%	4.8%	■	□	■
...from top 20%	15%	■	□	■
...from bottom 20%	21%	■	■	■

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