

An Exploration of the Factors that Motivate Gifted and Talented Rural Students to Engage in STEM

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Outline

- Background
- Case Study
- Inquiry Question/Rationale
- Methodology
- Results
- Future Plans

Background

Obstacles to STEM majors in rural areas

- Common parental and public misconceptions
- Misperceptions held by teachers
- Capacity issues outside classroom
- Obstacles external to school
- Obstacles in classroom

Case Study

- Chemical engineering undergraduate enrollment
- Illinois Institute of Technology
 - 0 Rural Students / 69 Student from Illinois
- University of Illinois – Chicago
 - 0 Rural Students / 174 Students from Illinois
- Northwestern University
 - 0 Rural Students / 37 Students from Illinois
- University of Illinois – Urbana-Champaign
 - 13 Rural Students / 368 Students from Illinois
 - 25 Students came from Naperville

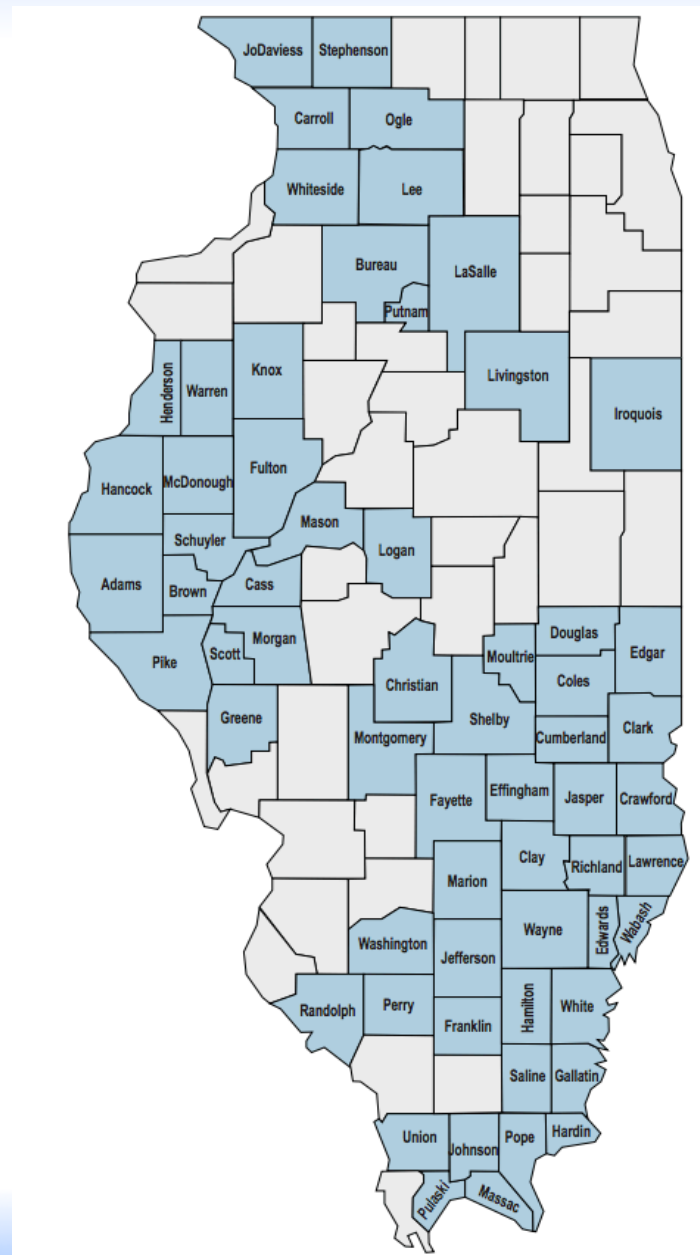
Inquiry Question/Rationale

What are the factors that motivate rural students to engage in STEM (science, technology, engineering, and mathematics)?

Inquiry Question/Rationale cont.

- The Census Bureau's urban-rural classification is fundamentally a delineation of geographical areas, identifying both individual urban areas and the rural areas of the nation. The Census Bureau's urban areas represent densely developed territory, and encompass residential, commercial, and other non-residential urban land uses.
- ⌘The Census Bureau identifies two types of urban areas:
 - Urbanized Areas (UAs) of 50,000 or more people;
 - Urban Clusters (UCs) of at least 2,500 and less than 50,000 people.
- “Rural” encompasses all population, housing, and territory not included within an urban area

Inquiry Question/Rationale cont.



Methodology

- Qualitative study
 - Interviews and focus groups
- Current IMSA students, alumni, parents
- Contact over email, social media, in person
- Consent forms over SurveyMonkey
- Transcribe audio recordings

Demographics: Students, n=16

- All two-parent households
- 6 (37.5%) attended STEM program before IMSA, 10 (62.5%) didn't
- Racial/ethnic makeup
 - Asians: 2 (12.5%)
 - Caucasians: 13 (81.25%)
 - Biracial: 1 (6.25%)
- Support System
 - Math team/gifted program: 2 (12.5%)
 - Parents/family: 10 (62.5%)
 - Little/none: 4 (25%)
- Reasons for enrolling in IMSA
 - Lack of challenge/resources, desire for better education

Demographics: Parents, n=21

- How many are in STEM careers?
 - 8 of the 21 parents surveyed had STEM careers
- Family's socioeconomic status
 - Lower Class: 3 parents (14.29%)
 - Middle Class: 17 parents (80.95%)
 - Upper Class: 1 parent (4.76%)
- Why did your child choose to enroll in a gifted, residential STEM high school?
 - Pursue an interest in science or math
 - To be challenged academically

Results

Prompt: Research suggests that there is a gap in STEM majors/careers in which rural students do not major in or enter STEM fields as often as suburban or urban students. Why do you think this gap exists?

“Teacher gives you essentially exactly what’s on the test, you regurgitate it back up, and then you dismiss it until the final. And I feel like I was very bored with that, that to do anything, I didn’t feel like I was learning anything. .”

-Anonymous Student

Results cont.

Prompt: Describe your motivation to pursue or engage in STEM education.

“...it was just the coolest thing to walk in and have an entire school of people who liked school...the school I came from, the people dreaded being there. On a given day, 80% might show up and they would all text through class, or sleep through class, pass notes because a lot of them couldn't afford phones, which is a sad reality.”

-Anonymous Student

Results cont.

Prompt: Discuss your perception of rural students engaged in or trying to pursue STEM.

“I didn’t want their excitement for math and science to kind of be extinguished through bad instruction or just getting to college unprepared and just being supremely out qualified by others.”

-Anonymous Parent

“It was a lot easier to get him enrolled in like a basketball clinic or football clinic or baseball clinic [than it was to find STEM programs]”

-Anonymous Parent

Future Plans

- Analyze data for common themes, patterns, and trends by group (parents, students, alumni)
- Submit final article to Illinois Association for Gifted Children Journal in October
- Proposal to present at conference in beginning of 2018



References

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Thank you!

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Professional Field Services