Session A-1: Multicultural Perspectives: Working with Diverse Student Populations

Adrienne Coleman
An Exploration of the Factors that Motivate Gifted and Talented Black Males to Engage in Science, Technology, Engineering and Mathematics (STEM)

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Chapter 1 - Introduction
Introduction

- Black male students are academically underachieving.

- Black male students typically are not exposed to gifted classrooms.

- Black male students have limited exposure to Science, Technology, Engineering, and Mathematics (STEM) experiences.
Introduction

This leads to a STEM gap in which the Black male is rarely involved in STEM education and STEM careers.

This study examines why certain Black males have the motivation to become gifted and talented learners, and how that motivation is defined and manifested in the Black male as well as why the Black male decides to pursue STEM.
The Problem

Academic Underachievement

Lack of Gifted and Talented Programs

Lack of Exposure to STEM
The Problem

The specific problem that was addressed is the lack of motivation among Black males to become gifted and talented learners engaged in STEM.
Purpose of the Study

- The proposed study will also inform the design of a motivation-based academic achievement curriculum to encourage gifted and talented Black males to engage in STEM.
Research Question

- What factors do gifted and talented Black males identify as motivating them to engage in Science, Technology, Engineering and Mathematics (STEM) at the Illinois Mathematics and Science Academy, a residential academy for gifted/talented students?
Limitations and Delimitations

- Gifted and Talented
- Black Male
- Midwest
- Residential Academy
- STEM
Definition of Terms

• **Black or African American**: These terms refer to a person having origins in any of the Black racial groups of Africa. (U.S Census Bureau, 2013, para. 2).

• **Gifted and talented**: Those who demonstrate outstanding levels of aptitude (defined as an exceptional ability to reason and learn) or competence (documented performance or achievement in top 10% or rarer) in one or more domains (National Association for Gifted Children [NAGC], 2013, para. 4).
Definition of Terms

• **Motivation**: “The level of effort an individual is willing to expend towards the achievement of a certain goal” (Pew, 2007, p. 14).

• **Science, Technology, Engineering and Mathematics (STEM)**: “an interdisciplinary or trans-disciplinary approach to learning where rigorous academic concepts are coupled with real-world problem-based and performance-based lessons” (CA Department of Education, 2013, para. 1).
Significance of the Study

This study contributed to positive literature on gifted and talented Black males and may help to inform STEM curriculum (Dixon et al., 2010; McGee, & Martin, 2011a).

This study served as the authentic voice of the gifted and talented Black males regarding their motivation to engage in STEM.

This study will be utilized as a foundation to minimize the achievement gap by developing a framework that motivates gifted and talented Black males to be engaged in STEM.
Significance of the Study

• This study may lead to enhanced motivation in gifted and talented Black males to engage in STEM, which may assist IMSA as well as other National Consortium for Specialized Secondary Schools of Mathematics, Science and Technology (NCSSSMST) affiliate schools in their goal of diversity (IMSA, n.d., para. 2).
Chapter 2 – Literature Review
Perspectives of the Black Male

• The Black male is a professional, intelligent, nurturing human being who is a positive, valued member of society (Blake & Darling, 1994).

• The Black male is a violent, lazy, dysfunctional being who does not value much in society (Shea, 1995; Strayhorn, 2010; Wilson, 2002).
Positive Portrayals of the Black Male

• What is a Black Man?
  – “a husband and father, son and brother, lover and boyfriend, uncle and grandfather, construction worker and sharecropper, minister and ghetto hustler, doctor and mineworker, and auto mechanic and presidential candidate” (Blake & Darling, 1994, 402).

• The 1995 Million Man March

• The Black Man Can

• Black Male Skepticism – Vanderbilt University
Negative Portrayals of the Black Male

ISSUE
- The five D’s
  - Dumb, Deprived, Dangerous, Deviant, and Disturbed
- Unintelligent
- Lazy
- Criminal Inclined
- Always in Danger (Nasir & Shah, 2011; Parson & Kritsonis, 2006).

WHY???
- Racism
- Socioeconomic Disadvantages
- Oppression are at the root of the problem
- Black Male President
The Black Male’s Education

• Black Males Achievement
  – I think that education is the great equalizer. I feel like if you can get more Black males educated and if you can get more minority people educated in general, then you uplift the whole society because education puts people on an equal playing field (Harper & Davis, 2012, pp. 113-115).
  – As an African American person who has been underprivileged, underrepresented, and who has witnessed the failures of an inadequate school system, I want to be one of the many examples that demonstrate that we as a people can overcome socioeconomic barriers and still choose education as a pathway (Harper & Davis, 2012, pp. 113-115).
The Black Male’s Education

• Black Males Underachievement
  – Black male students score lower than White students in reading, vocabulary, and mathematics (Robinson & Biran, 2006).
  
  – Only 41% of Black males graduate from high school and those who graduate are not college ready (Graham & Anderson, 2008; Lesesne, 2012).
  
  – Only 32% of Blacks compared to 66% of Whites between the ages of 18 and 24 are enrolled in a degree-granting institution according to the U.S. Census.
A Historical and Legal Perspective of Education and the Black Male

- Plessy v. Ferguson
- Brown v. Board of Education
- Regents of the University of California v. Bakke & Grutter v. Bollinger
- Fisher v. University of Texas

Levels:
- Separate, but Equal
- Integration
- Affirmative Action
- Leveling the Playing Field
A Historical and Legal Perspective of Education and the Black Male
The Black Male Academic Achievement Gap

• A cognitive gap begins as early as nine months of age in Black males, widens by two years of age, and by fifth grade cognition lags by nearly two full years (ETS, 2011).

• Children are suffering from a toxic cocktail of poverty, illiteracy, racial discrimination and massive incarceration that sentences poor boys to dead-end hopeless lives” (ETS, 2011, p. 2).
The Black Male Academic Achievement Gap

• Racial Identity Conflict
  – A persistent source of academic underachievement in Black males

• “Acting White”
  – Black Males tend to deny or hide their talent and potential in order to not being seen or viewed as smart or valuing academic achievement (Emdin, 2011; Stinson, 2006, 2010).

“Cool Pose”
– A defense mechanism and ritualized form of masculinity that allow them to cope with oppression, racism and oppression (Stinson, 2006; Whiting, 2006).
The Black Male Gifted and Talented Education Gap

• “African American gifted male students become caught in this middle position . . . not real enough and too smart to be part of the home community and not cultured enough or too foreign to be part of the mainstream” (Bonner, Jennings, Marbley, & Brown, 2008).

• Raceless Persona Theory
  – The conflict Black students face when they achieve academic success (Stinson, 2006).
The Black Male STEM Education Gap

ISSUE

• Black students are academically four years behind their White counterparts and score below approximately 75% of White America in mathematics (McGee & Martin, 2011a).

• Fewer than 10% of Black students complete the high school mathematics sequence, which includes algebra, geometry, trigonometry, and pre-calculus (McGee & Martin, 2011a).

WHY???

• Lack of STEM exposure in K-12

• Lack of a STEM mentor

• Unqualified teachers

• Mathematics phobia

• Failure of students to see the application of science to their lives

• Watching too much television (Dumais, 2008; QEMN, 2010; Toldson & Brown, 2009).
The Black Male STEM Education Gap

• The fact that I am considered a successful mathematics student has a lot to do with my math teacher, Mr. Greece, because math was my worst subject. There were times when I would want to give up, maybe it’s just not for me, but he told me don’t give up, it’s not hard, you can do it (Sheppard, 2006, p. 4).

• One of the keys to my success is that I am curious. Curiosity killed the cat, but in my case, curiosity made the cat genius (Sheppard, 2006, p. 4).

• My parents have a big influence on me. My mom likes to brag to her friends and family about how well I’m doing. That inspires me to try harder (Sheppard, 2006, p. 4).
History of Black Males Engaged in STEM

1700's
- Thomas Fuller
  Mathematician

1700's
- Benjamin Bannekar
  Scientist & Mathematician

1872
- Elijah McCoy
  Engineer

1876
- Edward Alexander
  Bouchet
  Scientist

1893
- Dr. Hale Williams
  Scientist

1896
- Lewis Baxter Moore
  Mathematician
History of Black Males Engaged in STEM

Early 1900’s
George Washington Carver
Scientist

1960’s
James West
Scientist

1940’s
Vivien Thomas
Scientist

1930’s
William Waldron Schieffelin Claytor
Mathematician

1970’s
Clarence Skip Ellis
Computer Scientist

Present
Freeman Hrabowski
Mathematician & Scientist
The Black Male’s Motivation to Achieve Academically

- Self-motivation: personal drive, family influences (parents instill in them early on the desire to be academically successful and do their best and explore what life has to offer) (Griffin, 2006).
- Racial background: awareness of stereotypes about academic abilities of African Americans and a desire to challenge those misperceptions (Griffin, 2006).
- Academic struggles: facilitate motivation and desire to succeed (Griffin, 2006).
Minimizing the Black Male Academic Achievement and STEM Education Gaps

• Researchers who endeavor to improve the African American male’s success in education should commit at least a fraction of their intellectual efforts to studying those within the race who have earned good grades, avoided trouble and school suspension, assumed leadership positions, responded productively to racial stereotypes, resolved masculine identity conflicts, amassed social capital they previously lacked and negotiated same-race peer support for their school achievement (B. L. Wright, 2011, p. 8).
Chapter 3 - Methodology
Research Question

• What factors do gifted and talented Black males identify as motivating them to engage in Science, Technology, Engineering and Mathematics (STEM) at the Illinois Mathematics and Science Academy, a residential academy for gifted/talented students?
Research Design

Qualitative → Phenomenon → Case Study
Access and Permission

• The Illinois Mathematics and Science Academy Institutional Review Board

• Argosy University Institutional Review Board
Participants

• Focus Groups with 10 to 15 Black male students currently attending the Illinois Mathematics and Science Academy and their parent(s)

• Interviews with 15 to 20 Black male alumni of the Illinois Mathematics and Science Academy and their parent(s)

• Interviews with 10 to 15 IMSA faculty/staff from academic and student affairs departments.
Data Collection Instrument

• Why are you engaged in STEM (science, technology, engineering and mathematics) education and whom/what do you give credit to for your initiation/interest in STEM education?

• Describe your motivation to pursue/engage in STEM education…

• Discuss your intrinsic motivation (“behaviors performed out of interest and enjoyment”) as it relates to you being a gifted and talented learner engaged in STEM…provide examples in which your motivation to engage in STEM was developed…

• Discuss your extrinsic motivation (“behaviors carried out to attain contingent outcomes”) as it relates to you being a gifted and talented learner engaged in STEM…provide examples in which your motivation to engage in STEM was enhanced…

• How has your enrollment in a gifted, residential high school contributed to your motivation to engage in STEM?

• The literature suggests that there is gap in STEM majors/careers in which Black males do not major in or enter STEM fields as often as their White and Asian counterparts …why do you think this gap exists, what makes you different and how would you motivate Black male students to engage in STEM?
Data Collection Instrument

• Discuss your perception of the gifted and talented Black male pursuing/engaged in STEM education…

• What do you perceive to be the intrinsic motivators (“behaviors performed out of interest and enjoyment”) that have led gifted and talented Black males to engage in STEM…provide examples in which this motivation was observed?

• What do you perceive to be the extrinsic motivators (“behaviors carried out to attain contingent outcomes”) that have led gifted and talented Black males to engage in STEM…provide examples in which this motivation was observed?

• How does being in a gifted, residential community contribute to motivation of gifted and talented Black males engaged in STEM?

• The literature suggests that there is gap in STEM majors/careers in which Black males do not major in or enter STEM fields as often as their White and Asian counterparts ...why do you think this gap exists and how would you motivate Black male students to engage in STEM?
Data Processing and Analysis

- Adobe Connect
- Microsoft Excel
- Visual Thesaurus

Triangulation Analysis

Faculty
Staff
Parents
Black
Males
Literature
Findings – Black Male IMSA Students

- **Background**
  - 20 Black Male IMSA Students
    - 11 identified as only Black/African American, 9 identified as Bi/Multiracial
    - 10 seniors, 7 Juniors, 3 Sophomores
    - 15 Middle Class, 5 Lower Class
    - 12 from two-parent households, 6 from single-parent households, 2 from other household situations

- **STEM Support System**
  - Family
  - Teachers
  - School System
  - Friends
Findings – Black Male IMSA Students

• Why are you Engaged in STEM? n = 15
  – Themes
    • Enjoy STEM, n = 5 (40%)
    • Good at STEM, n = 4 (27%)
    • STEM is a Progressive Field, n = 3 (20%)
    • To Solve Problems and Advance Humanity, n = 2 (13%)
    • Pursuit of Scientific Knowledge, n = 1 (7%)
Findings – Black Male IMSA Students

- Motivation to Pursue/Engage in STEM Education, n = 9
  - Themes
    - Passion for STEM, n = 4 (44%)
    - Money, n = 4 (44%)
    - Solve Problems/Advance Humanity, n = 4 (44%)
    - Learning/Discovery of Knowledge, n = 3 (38%)
Findings – Black Male IMSA Students

• Intrinsic Motivation to Engage in STEM, n = 11
  – Themes
    • Competitive nature of STEM, n = 6 (55%)
    • Solve Problems/Advance Humanity, n = 5 (45%)
    • Learning/Discovery of Knowledge, n = 4 (36%)
    • Obligation to Black Community, n = 2 (18%)
Findings – Black Male IMSA Students

• Extrinsic Motivation to Engage in STEM, n = 11
  – Themes
    • Future Success, n = 6 (55%)
    • STEM Enjoyment/Advance Humanity, n = 4 (36%)
    • Money, n = 3 (27%)
    • Obligation to Black Community, n = 2 (18%)
Findings – Black Male IMSA Students

- IMSA’s Contribution to STEM Motivation, n = 12
  - Themes
    - Enhanced Motivation, n = 11 (92%)
    - Challenge/Better Education, n = 5 (42%)
    - Immersion in STEM, n = 4 (33%)
    - Diverse Environment, n = 3 (25%)
    - Hindered Motivation, n = 2 (17%)
    - Self-awareness, n = 1 (8%)
Findings – Black Male IMSA Students

• Why is there a STEM Gap? n = 15
  – Themes
    • Lack of STEM Vision for Blacks, n = 6 (40%)  
    • Lack of STEM Parental Support, n = 6 (40%)  
    • Negative Stigma of/Misperceptions about Black Males, n = 3 (20%)
Findings – Black Male IMSA Students

• How to Minimize the STEM Gap? \( n = 8 \)
  – Themes
    • Black Male Mentors/Role Models, \( n = 5 \) (63%)
    • Early STEM Exposure, \( n = 1 \) (13%)
    • Nation-Wide STEM Intervention, \( n = 1 \) (13%)
    • Educate Parents, \( n = 1 \) (13%)
Findings – Black Male IMSA Students

• What factors do gifted and talented Black males identify as motivating them to engage in Science, Technology, Engineering and Mathematics (STEM) at the Illinois Mathematics and Science Academy, a residential academy for gifted/talented students?
  – Learning: Discovery of Knowledge
  – Desire to Solve Problems to Advance Humanity
  – Money
  – STEM is a Progressive Field that Leads to Success
  – Competitive Nature of STEM
  – Passion for STEM/STEM Enjoyment
  – Obligation to Black Community/Break Negative Stigmas about Black Males
Findings – Black Male IMSA Students

- What factors do gifted and talented Black males identify as motivating them to engage in Science, Technology, Engineering and Mathematics (STEM) at the Illinois Mathematics and Science Academy, a residential academy for gifted/talented students?

  - It’s more of an obligation and not necessarily to anyone around me, but to my ancestry. As I have gone through my education and gotten older, the struggle of African Americans in America has grown more and more important to me as a person; and I feel like the opportunities that I’m offered no matter how good or bad they are, they are education. The more that I am offered these opportunities and I know I need to do well because the people before me did not have these opportunities, and they paved the way to make sure I did have these opportunities. So when I do get the chance to learn something new, I take it as chance to take advantage and appreciate what other people have done for me. When I get out into the world I know that what I’m doing was someone else’s dream. I know that the work that I am doing and the knowledge that I have is because someone worked for me.

  - But in terms of intrinsic things that motivate me, I’ve always had an inner drive to do my best. I try to think deep. I don’t know where that comes from; it’s just a part of who I am. So academically and no matter what, whether I’m playing sports or volleyball, I just do the best I can; and at the end of the day, I always want to know that I’ve done the best. So even academically I’ve talked to my parents about why don’t you push me harder. I should have gotten an A in this class; my parents are like, your grades are good. How do you say they are good? I know I could have done better. So I’ve always been pushing myself, even harder than those people around me and I guess what desires me to push the hardest in STEM is the passion for me.
Findings – Black Male IMSA Alumni

• Background
  – 25 Black male IMSA Alumni
    • 20 identified as only Black/African American, 5 identified as Bi/Multiracial
    • 16 from two-parent households, 9 from single-parent households
    • 15 Middle Class, 5 Lower Class during High School
    • 22 Middle Class, 2 Lower Class, 1 Upper Class Currently
Findings – Black Male IMSA Alumni

• Profession
  – Undergraduate Student, n = 13
  – Engineer, n = 3
  – Physician, n = 2
  – Medical Student, n = 1
  – Software Quality Assurance Analyst, n = 1
  – Owner of an International Supply Chain Consultant Business, n = 1
  – Fighter Pilot with the United States Air Force, n = 1
  – Procurement Financial Analyst with Boeing Company, n = 1
  – Corporate Lawyer, n = 1
  – Associate Coordinator with the National Basketball Association, n = 1

• STEM Support System
  – Parents
  – Family
  – Teachers
  – School System
  – Friends
  – Church
  – Black Male Professional Organizations
Findings – Black Male IMSA Alumni

• Why are you Engaged in STEM?
  – Themes
  • STEM Interest, n = 13 (52%)
  • Good at STEM, n = 7 (28%)
  • Intellectual Curiosity, n = 5 (20%)
  • Problem-Solving aspect of STEM, n = 4 (16%)
  • Future Success, n = 4 (16%)
  • STEM is a Prominent, Progressive Field, n = 2 (8%)
Findings – Black Male IMSA Alumni

- Motivation to Pursue/Engage in STEM Education
  - Themes
    - Learning/Discovery of Knowledge, n = 8 (32%)
    - To Advance Humanity, n = 7 (28%)
    - Future Success, n = 7 (28%)
    - Passion for STEM, n = 6 (24%)
    - STEM is a Progressive Field, n = 6 (24%)
    - Competitive Nature of STEM, n = 4 (16%)
    - Break Negative Stigmas of Black Males/Be a Role Model, n = 3 (12%)
Findings – Black Male IMSA Alumni

• Intrinsic Motivation to Engage in STEM
  – Themes
  • Learning/Discovery of Knowledge, n = 11 (44%)
  • Solve Problems/To Advance Humanity, n = 9 (36%)
  • Obligation to the Black Community, n = 6 (24%)
  • Competitive Nature of STEM, n = 2 (8%)
Findings – Black Male IMSA Alumni

• Extrinsic Motivation to Engage in STEM
  – Themes
    • Break Negative Stigmas about Black Males, n = 8 (32%)
    • Obligation to Black Community, n = 8 (32%)
    • Future Success, n = 4 (16%)
    • STEM Enjoyment, n = 3 (12%)
    • STEM Exposure, n = 3 (12%)
    • Self, n = 2 (8%)
    • Money, n = 1 (4%)
Findings – Black Male IMSA Alumni

- IMSA’s Contribution to STEM Motivation
  - Themes
    - Enhanced Motivation, n = 21 (84%)
    - Immersion in STEM, n = 10 (40%)
    - Diverse Environment, n = 9 (36%)
    - Hindered Motivation, n = 4 (16%)
    - Challenge/Better Education, n = 3 (12%)
    - Self-Awareness, n = 3 (12%)
Findings – Black Male IMSA Alumni

• Why is there a STEM Gap?
  – Themes
    • Lack of STEM Vision for Blacks, n = 13 (52%)
    • Lack of STEM Exposure, n = 13 (52%)
    • Negative Stigma of/Misperceptions about Black Males, n = 6 (24%)
    • Lack of STEM Parental Support, n = 2 (8%)
Findings – Black Male IMSA Alumni

• How to Minimize the STEM Gap?  n = 16
  – Themes
    • Black Male Mentors/Role Models, n = 14 (88%)
    • STEM Exposure Within and Beyond Classroom, n = 4 (25%)
Findings – Black Male IMSA Alumni

- What factors do gifted and talented Black males identify as motivating them to engage in Science, Technology, Engineering and Mathematics (STEM) at the Illinois Mathematics and Science Academy, a residential academy for gifted/talented students?
  - Learning: Discovery of knowledge
  - Obligation to Black community/break negative stigmas about Black males
  - Solve problems/to advance humanity
  - Success
  - STEM passion/enjoyment
  - STEM is a prominent/progressive field
  - Competitive nature of STEM
  - STEM exposure
  - Self
  - Money
Findings – Black Male IMSA Alumni

What factors do gifted and talented Black males identify as motivating them to engage in Science, Technology, Engineering and Mathematics (STEM) at the Illinois Mathematics and Science Academy, a residential academy for gifted/talented students?

– For me, it started just in general in that I wanted to contribute to society in a positive manner; it’s like kind of what my general dream was when I was a kid, just to be like able to make some people’s lives better and so it just kind of happened that STEM came in and I was good in math and science. . . . That’s kind of where my motivation comes from is to be able to use that skillset and that knowledge that I’ll acquire in engineering and technology to be able to make that positive impact in the future.

– Just like the community and the environment around me and just my own upbringing seeing everything that I’ve had the opportunity to be able to do and like the support and everything that I’ve had growing up and all the inspiration around me and being able to apply that to things and people who don’t necessarily have that and to see where there are areas or things or people that might not have that, those opportunities to do those type of things and be able to engage in STEM; that is like the core of my drive to be doing that.
Findings – All Black Males: IMSA Alumni and Current Students, n = 45

What factors do gifted and talented Black males identify as motivating them to engage in Science, Technology, Engineering and Mathematics (STEM) at the Illinois Mathematics and Science Academy, a residential academy for gifted/talented students?

- Patterns
  - STEM is a progressive field which leads to success, n = 28 (62%)
  - Learning/Discovery of knowledge, n = 25 (56%)
  - Solve problems/to advance humanity, n = 21 (47%)
  - Obligation to Black community/break negative stigmas, n = 16 (36%)
  - Passion for STEM/STEM enjoyment, n = 10 (22%)
  - Competitive nature of STEM, n = 8 (18%)
  - Money, n = 8 (18%)
Findings – IMSA Faculty/Staff

• Background
  – 27 IMSA Faculty/Staff
    • 16 Faculty, 8 Staff, and 3 Administrators
      – 6 from IMSA PROMISE (Providing Opportunities to Engage in Mathematics and Science) pre-enrichment program
    • Faculty
      – 5 from Science, 4 from Mathematics, 3 from Social Science, 2 from English, 1 from Foreign Languages, 1 from Wellness
    • Staff
      – Student Life, Admissions, College and Academic Counseling, Information Resource Center, Enrollment and Academic Opportunities, Residential Life, and Professional Field Services.
  • Administrators - President and Principals Offices
Findings – IMSA Faculty/Staff

• Perception of Black Males Engaged in STEM
  – Themes
    • Struggle with STEM rigor, $n = 7$ (26%)
    • Hard-working/passionate, $n = 5$ (19%)
    • Wide range of giftedness, $n = 5$ (19%)
    • Lack STEM encouragement, $n = 4$ (15%)
    • Must act “cool”/identity conflict, $n = 4$
    • No different than any other student, $n = 4$ (15%)
    • STEM is who they are, $n = 3$ (11%)
    • Tries to take advantage of perceived victimization, $n = 3$ (11%)
    • STEM encouragement, $n = 2$ (8%)
    • Nerds/Geeks, not the “cool” guys, $n = 2$ (8%)
    • Leaders, $n = 2$ (8%)
    • Self-aware, $n = 1$ (4%)
Findings – IMSA Faculty/Staff

• Perception of Intrinsic Motivation to Engage in STEM, n = 26
  – Themes
    • Good at STEM, n = 13 (50%)
    • Success, n = 7 (27%)
    • Obligation to Black Community, n = 6 (23%)
    • Learning, n = 4 (15%)
    • Challenge, n = 4 (15%)
    • Break Negative Stigmas of Black Males, n = 3 (12%)
    • Leadership, n = 2 (8%)
    • Competition, n = 1 (4%)
Findings – IMSA Faculty/Staff

• Perception of Extrinsic Motivation to Engage in STEM, \( n = 26 \)
  – Themes
    • Break Negative Stigmas about Black Males, \( n = 12 \) (46%)
    • The Illinois Mathematics and Science Academy, \( n = 9 \) (35%)
    • Future Success, \( n = 7 \) (27%)
    • Peer Acceptance/Competition, \( n = 3 \) (8%)
Findings – IMSA Faculty/Staff

• Perception of IMSA’s Contribution to STEM Motivation
  – Themes
    • Enhanced Motivation, n = 25 (93%)
    • Diverse Environment, n = 18 (67%)
    • Collaborative Support Group, n = 10 (37%)
    • Hindered Motivation, n = 9 (33%)
    • Opportunity, n = 8 (30%)
    • Independence/Leadership, n = 5 (15%)
    • Competition, n = 3 (11%)
    • Challenge, n = 2 (7%)
Findings – IMSA Faculty/Staff

• Why is there a STEM Gap?
  – Themes
    • Lack of STEM Vision for Blacks, n = 15 (58%)
    • Lack of STEM Exposure, n = 14 (54%)
    • Lack of STEM Parental Support, n = 5 (19%)
Findings – IMSA Faculty/Staff

• How to Minimize the STEM Gap?  n = 16
  – Themes
    • STEM Exposure, n = 10 (63%)
    • Black Male Mentors/Role Models, n = 9 (56%)
  – http://www.youtube.com/watch?v=eZCcU6ATtEA&feature=youtu.be
Findings – IMSA Faculty/Staff

- What factors do gifted and talented Black males identify as motivating them to engage in Science, Technology, Engineering and Mathematics (STEM) at the Illinois Mathematics and Science Academy, a residential academy for gifted/talented students?
  - Obligation to Black community
  - Success
  - Good at STEM/STEM interest
  - IMSA
  - Learning
  - Challenge
  - Competition/peer acceptance
  - Break negative stigmas of Black males
  - Leadership
Findings – IMSA Faculty/Staff

- What factors do gifted and talented Black males identify as motivating them to engage in Science, Technology, Engineering and Mathematics (STEM) at the Illinois Mathematics and Science Academy, a residential academy for gifted/talented students?
  - Their intrinsic motivation comes from their confidence, knowing and learning and wanting to learn more, but it is also when they are successful. When they are successful, then they want to do more. Examples of that would be students at IMSA go up against a teacher that they feel that they never could communicate with or that teacher will never listen or help me. Once they realized that the teacher is there for them, and willing to help and guide them, the teacher is there to work with them or sometimes banter with them. Then I believe that is when the tables turn a little bit. Confidence is built, and that they are finding success. It’s also that sometimes it is fun. Sometimes I see the students doing different experiments with different peers, which looks like they are having a lot of fun. I think that’s where it comes from. IMSA students study STEM and their intrinsic motivation is also the fact that they know they could do and that it is something else out there. There is something beyond what is in their community. For others, it’s there because they want to be better or learn.
Findings – IMSA Parents

• Background
  – 21 IMSA Parents
    • 16 are Parents of Current Black Male Students
    • 5 are Parents of Black Male Alumni
    • 8 are in STEM Fields
    • ALL Fully Support their Student in STEM
Findings – IMSA Parents

• Perception of Black Males Engaged in STEM
  – Themes
    • Curious/inquisitive, \( n = 5 \) (24%)
    • STEM encouragement, \( n = 5 \) (24%)
    • Self-motivated/independent, \( n = 4 \) (19%)
    • Few Black males in STEM, \( n = 4 \) (19%)
    • STEM interest, \( n = 3 \) (14%)
    • Early STEM exposure, \( n = 3 \)
    • Lack STEM vision, \( n = 3 \) (14%)
    • Stereotyped /break negative stigmas of Black males, \( n = 2 \) (10%)
    • No different than any other student, \( n = 1 \) (5%)
Findings – IMSA Parents

- Perception of Intrinsic Motivation to Engage in STEM
  - Themes
    - Good at STEM/STEM Interest, n = 9 (43%)
    - Curious/Inquisitive, n = 6 (29%)
    - Determined/Self-motivated, n = 4 (19%)
    - Competition, n = 3 (14%)
    - Challenge, n = 2 (10%)
    - Learning, n = 2 (10%)
    - Success, n = 1 (5%)
Findings – IMSA Parents

• Perception of Extrinsic Motivation to Engage in STEM
  – Themes
    • Obligation to/Push from Black Community, n = 14 (67%)
    • Teachers, n = 7 (33%)
    • STEM Exposure, n = 5 (24%)
    • The Illinois Mathematics and Science Academy, n = 4 (19%)
    • Challenge, n = 4 (19%)
    • Competition, n = 2 (10%)
Findings – IMSA Parents

• Perception of IMSA’s Contribution to STEM Motivation
   – Themes
   • Enhanced Motivation, n = 21 (100%)
   • Diverse Environment, n = 16 (76%)
   • Challenge, n = 7 (33%)
   • Hindered Motivation, n = 4 (19%)
   • Independence/Responsibility, n = 3 (14%)
   • Collaborative support groups, n = 3 (14%)
   • STEM Immersion, n = 2 (10%)
   • Opportunity, n = 2 (10%)
   • Competition, n = 2 (10%)
Findings – IMSA Parents

• Why is there a STEM Gap?
  – Themes
  • Lack of STEM Vision for Blacks, n = 14 (67%)
  • Lack of STEM Exposure, n = 11 (52%)
  • Lack of STEM Parental Support, n = 6 (29%)

Helping Parents Prepare African-American Children for STEM Careers

Dr. Ronald Fortune
Dr. Rex Fortune

CAAASA State Conference
February 21, 2013
Sacramento, CA
Findings – IMSA Parents

• How to Minimize the STEM Gap? n = 16
  – Themes
    • STEM Exposure, n = 13 (62%)
    • Black Male Mentors/Role Models, n = 10 (48%)
    • Government Intervention, n = 1 (5%)
Findings – IMSA Parents

- What factors do gifted and talented Black males identify as motivating them to engage in Science, Technology, Engineering and Mathematics (STEM) at the Illinois Mathematics and Science Academy, a residential academy for gifted/talented students?
  - Obligation to Black community
  - Good at STEM/STEM interest
  - Teachers
  - Curious/inquisitive nature
  - STEM exposure
  - Determination/self-motivated
  - Challenge
  - IMSA
  - Competition
  - Learning/discovery of new knowledge
  - Success
Findings – IMSA Parents

- What factors do gifted and talented Black males identify as motivating them to engage in Science, Technology, Engineering and Mathematics (STEM) at the Illinois Mathematics and Science Academy, a residential academy for gifted/talented students?

  - Ever since he was a kid he thought it was fun, he really did. I don’t think it was the— it’s going to make me a better person, it’s going to make me smarter than people. He thought math was fun ever since he learned it. When he was a kid, he was two, and I would ask him, “What do you want to play?” “Let’s play math.” “Let’s do subtraction,” because we had the flash cards, adding, subtracting, dividing, multiplying, and we had money. “Let’s do multiplying,” and I would say, “That’s not a game; that’s for study time.” He would say, “That’s what I want to play.” It was fun to him, and at first we were just like “okay,” and so that was his motivator, he got it. I have always told him he has this gift when it comes to math because he sees it differently than all of us. For us we have to learn it, study it, make it make sense. To him it just made sense, it literally is fun. The boy has slept with a math book every night for the last, eight, nine, ten years . . . I really have to fight him to do something outside of math, and he takes it upon himself, he enjoys it. That’s his thing!
Findings – IMSA Faculty/Staff & Parents, n = 48

- What factors do gifted and talented Black males identify as motivating them to engage in Science, Technology, Engineering and Mathematics (STEM) at the Illinois Mathematics and Science Academy, a residential academy for gifted/talented students?

  - Patterns
    - Obligation to Black community, n = 28 (58%)
    - Good at STEM/STEM interest, n = 22 (46%)
    - IMSA, n = 13 (27%)
    - Challenge, n = 8 (17%)
    - Competition, n = 6 (13%)
    - Learning, n = 6 (13%)
Conclusion: All Participants, n = 93

• What factors do gifted and talented Black males identify as motivating them to engage in Science, Technology, Engineering and Mathematics (STEM) at the Illinois Mathematics and Science Academy, a residential academy for gifted/talented students?

– Trends
  • Obligation to Black community
  • Success
  • Learning
  • Good at STEM/STEM Passion
  • IMSA
  • Competition
  • Solve problems/to advance humanity
  • Challenge
  • Leadership
Conclusion: Black Males, IMSA Faculty/Staff/Parent & Literature

- What factors do gifted and talented Black males identify as motivating them to engage in Science, Technology, Engineering and Mathematics (STEM) at the Illinois Mathematics and Science Academy, a residential academy for gifted/talented students?
  - Triangulation Analysis

  - Obligation to Black Community
  - Success
  - Learning
  - Good at STEM/STEM passion
  - Competition
Conclusion: Contributions to the Literature

- What factors do gifted and talented Black males identify as motivating them to engage in Science, Technology, Engineering and Mathematics (STEM) at the Illinois Mathematics and Science Academy, a residential academy for gifted/talented students?
Implications

1. Black males should be exposed to STEM learning experiences at an early age and consistently throughout their educational career to develop STEM skills and nurture STEM passion.

2. The STEM learning experiences for Black males should use IMSA as a model.

3. Although there is an immersion in STEM during these learning experiences, the curriculum should also include:
   - Historical and current Black news and issues
   - Self-awareness and student development

4. Black males should be regularly assessed to understand their strengths and weaknesses
   - Personalized evaluations should be created to emphasize their strengths and inform the development of their weaknesses.

5. The STEM areas in which the Black males have demonstrated strength need to be complimented with an activity in which that student can lead. Then the student should be provided with leadership opportunities outside of STEM and encouraged to be involved.
Recommendations

1. As a Black male engaged in STEM, Why did your pursue this career? What path did you take to get you to STEM? How would you encourage Black males to engage in STEM?

2. What motivates Black females and Latino males/females to engage in STEM?

3. Why does a Black male/female and Latino male/female STEM gap exist in which there are few of them in STEM majors and careers? How should this STEM gap be addressed?

4. As a Black male who has been identified as gifted and talented, why do you think a gifted achievement gap exists in which Black males achieve below their gifted and talented counterparts? How would you address this gap?

5. What motivates Black males to achieve academically? How do you motivate low achieving Black males to become high achievers?

6. Why does a Black male achievement gap exist, in which Black males typically achieve lower grades and standardized test scores compared to other subcultures of the population? How should this achievement gap be addressed?

7. As a Black male, what is your perspective of education and its significance in your life, as well as your vision of success?
Question and Answer
References

References


References


