



SRM 680 Final Poster Presentation

The Search for Athletic Mathletes: The Lack of Connections Between Mathematics and Collegiate Athletics

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Research Question: How does student-athletes' identity, authority figures, career goals, educational experiences, and support systems influence their attitude, interest, and motivation in pursuing mathematical or mathematically related fields of study.

Literature Review

The phrase "success breeds success" holds true for both athletics and mathematics. Research exists (Huffmon & Doyle, 2008; Papanikolaou, Nikolaidis, Patsiaouras, & Alexopoulos, 2003) promoting the attitude and actions of student-athletes in regards to their success in athletics, yet there is little to no research investigating the relationship between a student-athlete's support system, authority figures, career goals, or educational experiences and their attitudes toward mathematics. Myles Brand, the late president of the National Collegiate Athletic Association (NCAA), addressed this lack of current research focusing on the academic identity and experience of collegiate student-athletes at the 2008 colloquium *College Sports: A Legitimate Focus for Scholarly Inquiry?*. He commented that this deficiency in research focusing on student-athletes evidences the values and perceptions the academic community place on student-athletes education (Powers, 2008).

Myles Brand's desire to see an increase interest in academic studies that involve the student-athlete community was echoed by Scott Kretchmar, a professor of exercise and sports science at Pennsylvania State University. Kretchmar encouraged research from a broad spectrum of academic disciplines to take action to fill the current deficiency of inquiries (Powers, 2008). This lack of literature concerning student-athletes' mathematical achievement, interests, and perceptions, required me to synthesize research from two areas of focus: student-athletes' identity and overall education experience and factors relating to the general student population's attitude, motivation, interest, and achievement in mathematics.

Terms	Definitions
Student-Athlete	A member of an intercollegiate team affiliated with an institution's athletic department.
High Level of Mathematical Experience	Students-athletes with a <i>high level of mathematical experience</i> are those that have progressed beyond calculus IV and have engaged in formal mathematical proofs in their coursework
Moderate Level of Mathematical Experience	Students-athletes with a <i>moderate level</i> of mathematical experience are those who complete of mathematical courses above college algebra, but no greater than calculus IV. This evidences a solid foundational knowledge of mathematics.
Low Level of Mathematical Experience	Student-athletes completing mathematics courses at or below the level of college algebra constitutes a <i>low level of mathematical experience</i> , since it is the minimal requirement to fulfill the mathematical requirement for graduation at the institution of my research focus (University, 2009).

References

- Marx, J., Huffmon, S., & Doyle, A. (2008). The student-athlete model and the socialization of intercollegiate athletes. *Athletic Insight*, 10(1). Retrieved October 20, 2008, from <http://www.athleticinsight.com/Vol10Iss1/StudentAthleteModel.htm>
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- Powers, E. (2008, January 11). Scholars and Sports. *Inside Higher Ed*. Retrieved from <http://www.insidehighered.com/news/2008/01/11/ncaa>

Abstract

This qualitative study examined two collegiate student-athletes, from a Division I school, with differing levels of mathematical experience. I sampled the student-athlete population using a survey instrument to select the participants. I considered data from my individual interviews with these two student-athletes. The analysis of these interviews lead me to discover that a common influence on student-athletes was their previous experiences mathematics teachers. The data also suggested that student-athletes have multiple means of academic support that influence their overall academic success. I also found that my constructs did not all impact student-athletes' perception and engagement.

Methods

I created a survey instrument, Mathematical Experience Questionnaire (MEQ), so that I could purposefully sample the student-athlete population. This sampling technique allowed me to determine which research participants possessed high, moderate, and low levels of mathematical experience. The athletic department staff distributed these surveys during routine academic advising meetings.

I received 20 completed MEQs. From the 20 surveys I was able to carry out interviews with two student-athletes, Roxanne and Chelsea. The interviews were conducted in a semi-structured format, audio recorded, and later transcribed. The transcripts from these interviews served as my data that I analyzed and coded for reoccurring themes.

Findings

This study provides evidence that there are multiple factors that influence student-athletes' perceptions and engagement of mathematics. The influence of the constructs I developed from the literature and expert consultation appeared to coincide with my findings from the participants' interview data, except the impact career goals have on student-athlete's involvement with mathematics. Instead of playing an influential role, student-athletes' career goals seemed to be more of a culmination of the other constructs in regards to student-athletes' engagement of mathematics.

The research data also suggests that the student-athletes' experiences with their mathematics teachers was one of the common influencing factors in their perception and engagement of mathematics. The difference in which Roxanne recalls her mathematics teacher as "rude" and Chelsea's description of her mathematics teacher as "accepting" is reflected in both Roxanne's and Chelsea's current attitudes, educational experiences, and success involving mathematics. Now, Roxanne feels "I'm bad at math, so I don't like it.", while Chelsea sees mathematics as "...the subject that I'm a best at."

Roxanne and Chelsea saw their coaches and athletic department staff to be "very encouraging" and "push you to succeed" by providing services such as study hall and tutors that "gives you structure and time to get your work done." My two research participants also pointed to the "close knit" and "family" like nature of the student-athlete body at the university as an avenue of support. These supportive roles that student-athletes' coaches, peers, and athletic department play assisted in the success of Roxanne and Chelsea's overall academic studies, but rarely focused on just one specific discipline, such as mathematics.

Constructs	Descriptions	Examples from Research Data
Identity	Student-athletes' <i>identity</i> is constructed through their associated roles both inside and outside a school environment, and also by their relationships with their fellow student-athletes, athletic department, coaches, professors, and fellow classmates.	"...prove to them [classmates] like that you're at their intellectual level, cause there's sometimes that stereotype of the jock, they're not always the smartest in the crowd." "I think if maybe people can see me succeed and have fun doing everything, athletic and math, like it could give them a better perception of math." Coaches "They're very encouraging people and they may not necessarily know a lot about math, but they'll always at least try to find some way to help you." Parents "Just knowing like, that she[her mother] was like proud of like what you learned and stuff. ... Just that kind of stuff, positive reinforcement. It just all added up together." Teachers "...just rude and if you had questions on how to do it [math], he would just blow you off like you were stupid for not knowing it."
Career Goals	Student-athletes' <i>career goals</i> relate to their desired career upon graduation.	"I don't know, I just think the combination of me wanting to be a teacher and my ability in math, just kind of put those two together."
Educational Experiences	<i>Educational experiences</i> involve student-athletes' successes and tribulations while taking mathematics courses.	"I'm bad at math, so I don't like it." "I never really liked it [math], so I kinda chose a different path than a math or science based education."
Support System	A student-athletes' <i>support system</i> includes influence from their peers, teammates and sport as it relates to mathematics.	"We have study hall where it's like if you're a freshman you have to be in study hall, if you have a certain GPA below, certain GPA you have to go... I know a lot of people hate study hall, but at the same time I think it helps you, because you're there and like you are having to do your homework so it kinda gives you more structure and time to get your work done, maybe." "...we all study a lot together, even if we're not in the same courses. ...we really do help each other out a lot."

Participant Biographies

The participants from this study attend a public university in the Rocky Mountain region of the United States having an enrollment of roughly 12,000 students. There are a total of 369 student-athletes at this university.

Chelsea:

Chelsea was a third year junior year at the time of this study and majoring in mathematics with an emphasis in secondary education. She participated on the university's women's soccer team. She possessed a high level of mathematical experience.

Roxanne:

Roxanne was a fourth year senior at the time of this study and majoring in communications. She participated on the university's cross country and track teams. She possessed a low level of mathematical experience.

Future Research

Future research includes determining how collegiate educators and athletics departments alter student-athletes perceptions of mathematics and encourage their engagement in mathematics. Since most students only require one or two math classes, this only provides a limited opportunity for the mathematics educators to create an impact. Therefore, there may be a need to develop cooperation between athletic department and mathematics educators to have an affect on the student-athletes. Conducting a case study of athletic department in attempts to better understand the role the athletic department plays in student-athletes education and how it influences their academic goals and achievement. This knowledge may provide insight to the level and type of cooperation needed to effectively encourage student-athletes to engage in more mathematics and mathematically related courses.