Driving STEM Education via Motorsports a Closer Look at Donk Racing — A Work in Process Paper

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This work-in-progress research paper describes a community-based study to better understand the attraction of underrepresented minorities to an unconventional motorsport , Donk racing, as a pathway to STEM discovery. This study detects an unconscious attraction to STEM in African American youth who enjoy motorsports, especially automobile and motorcycle racing. Uncovering the attraction to STEM early in the educational process yields an opportunity to address the missing connections leading to career choices that provide greater social mobility and meet a national need. A research team has been working passionately on a groundbreaking study centered around the intriguing intersection of motorsports and STEM (Science, Technology, Engineering, and Mathematics) education. This mixed-method study seeks to understand the connection between academic preferences and career choices through the lens of motorsports enthusiasts.

Keywords: STEM, motorsports, Donk racing, URM youth, applied engineering

INTRODUCTION

This project explores how Donk racing, also known as Big Wheel or Big Rim racing, can serve as a compelling gateway to ignite interest in STEM among young minds especially in underserved communities. Donk racing, a division of NDRA, is the newest and fastest-growing racing sector in the United States. The research relevance is prompted by the minoritized fan base and use of applied engineering in an informal setting. It is theorized that this unique blend can inspire and engage students innovatively, promoting critical thinking and real-world applications of academic knowledge. This connection is being explored through the use of surveys and interviews of fans, drivers, and mechanics at racing events.

A professor at a midwestern regional institution discovered this motorsport while covering from COVID and was intrigued by the racing event from a scholarly perspective. The researcher stumbled upon a television show called Donkmaster that showcased Donk racing in rural settings with predominantly African American drivers, mechanics, and spectators. This was more than entertainment. She observed STEM in action, entrepreneurship, and cultural relevance concurrently on display. This was happening in a traditionally overlooked and underserved community, especially with respect to STEM education and career development. Understanding this example of informal STEM could lead to more culturally relevant examples or methods for the classroom. A photo of a Donk is below.

FIGURE 1
Z06 DONK CREDIT IN AND OUT CUSTOMS

LITERATURE REVIEW

Motorsports have long been recognized as an exciting and captivating field that combines engineering, technology, and high-performance vehicles. There has been a growing interest in exploring the connection between motorsports and STEM (Science, Technology, Engineering, and Mathematics) education in recent years. This literary analysis examines the existing literature on the topic to shed light on the potential benefits and challenges of integrating motorsports into STEM education into informal settings to attract more minority youth.

Integrating motorsports and STEM education offers unique opportunities for students to engage in hands-on learning experiences. According to Smith and Johnson (2018), motorsports provide a compelling context for applying STEM concepts and principles. Students can explore various aspects of engineering, such as aerodynamics, materials science, and mechanical systems, through the lens of designing and optimizing race cars. Motorsports' dynamic and fast-paced nature also adds excitement and real-world relevance to STEM learning.

Several studies have highlighted the positive impact of integrating motorsports into STEM education. For instance, Johnson and Brown (2020) conducted a case study in a high school setting. They found that students who participated in a motorsports-based STEM program demonstrated increased motivation, improved problem-solving skills, and a deeper understanding of STEM concepts. The hands-on nature of working with race cars fostered experiential learning, leading to higher levels of engagement and knowledge retention among students.

Furthermore, motorsports offer a platform to promote diversity and inclusion in STEM education. Traditional STEM fields have lacked participation by underrepresented groups, including women and minorities. By incorporating motorsports such as Donk racing, which has a diverse fan base, into STEM education, educators can create a more inclusive and accessible learning environment. As highlighted by Williams and Thompson (2019), exposing students from diverse backgrounds to motorsports can spark their interest in STEM and inspire them to pursue careers in these fields. Showing these students participants in motorsports that share their ethnicity can help them envision themselves in those roles (Robinson 2016).

However, there are challenges associated with integrating motorsports into STEM education. One of the primary concerns is the cost and accessibility of resources. Motorsports require specialized equipment, such as race cars, simulators, and testing facilities, which may be beyond the reach of many educational institutions (Smith & Johnson, 2018). Additionally, the expertise needed to facilitate motorsports-based

STEM programs may be limited, requiring partnerships with industry professionals and organizations. This study has the potential to garner the data corporate partners can use to justify an investment to partner with educational institutions to build the much-needed STEM pipeline.

A working example of this accessibility and cost concept is the comparison of the budgets for NASCAR teams, IndyCar teams, versus the budgets of Donk racing teams. Not only is the cost of racing often prohibitive in most of the tradition sectors, but the cost of attending an event as a spectator can also be prohibitive. The cost of admission, parking, and refreshments are vastly different between IndyCar, NASCAR, and Donk racing. Donk racing is the most affordable at an average cost of $20 - $25 per adult, $10 for children, and usually free parking. In contrast tickets to IndyCar races start at $75 dollars and may reach $250 depending on seating preference. Parking at an IndyCar race starts at $20 and can reach $50. Donk racing may answer the financial challenges to engagement in motorsports.

IndyCar and NASCAR have both started staging races in more urban areas such as Detroit and Chicago to grow and diversify their participants and fan bases. Simultaneously, both of these racing sectors report having gaps in their talent pipeline. In the current pipeline, people of color are noticeably absent in large numbers.

Another challenge is the perception of motorsports as a male-dominated and exclusive domain. This may discourage female students from participating or limit their engagement in motorsports-related STEM activities (Rainey, K., Dancy, M., Mickelson, R. et al. 2018). Addressing gender stereotypes and providing equal opportunities for all students is crucial in ensuring the success of motorsports-based STEM initiatives (Williams & Thompson, 2019).

The literature on motorsports and STEM education highlights the potential of integrating these two domains to enhance student learning and engagement. The hands-on, real-world applications of STEM principles in the context of motorsports can inspire students and promote diversity in STEM fields (Rainey, K., Dancy, M., Mickelson, R. et al. 2018). However, resource constraints and inclusivity challenges need to be addressed for effective implementation. Future research and collaborative efforts between educators, industry professionals, and policymakers can further explore the potential of motorsports as a vehicle for STEM education and its impact on students' academic and career trajectories.

Gap in Literature

There are minimal studies that tie motorsports to STEM education broadly focused on youth of all ethnicities. More specifically, no articles were found documenting African American youth observing or participating in a motor sport where they were the dominant culture such as Donk Racing.

FIGURE 2
SPECTATORS AT A DONK RACE CREDIT DRAGZINE

METHODOLOGY

Design of the Study

This is a mixed-method ethnographic study. Surveys and interviews are used to better understand the attraction of African Americans to Donk racing and an attraction to applied STEM utilized to improve performance of vehicles and the underlying principles of automobile racing.

The project plan outlined visits to four different racetracks – Piedmont, NC, Darlington SC, and Reynolds, GA, and Daytona, FL, to collect data during the summer months during the first year of the study. Each track was selected based on estimated attendance and relevance to the culture (Bottoms, Ciechanowski, K., Jones, K. dela Hoz, J., & Fonseca, A. L. ,2017). In tangent, the lead investigator contacted The Donkmaster, the television series star, via Instagram to request an interview. Her interaction with college students and young people prepared her for this investigation. She knew many people in the targeted demographic responded more quickly to social media than traditional phone calls, texts, or emails. The Donkmaster, Sage Thomas, eventually replied to the investigator and agreed to an interview. The details of that interview will be presented in a separate case study that explores STEM, motorsports and entrepreneurship as experienced by an African American male.

Data Collection

Data was to be collected by interviewing drivers and mechanics, while surveying observers and fans. Initially there were plans to convene focus groups as well. After visiting one racing event, it was quickly discovered that focus groups were not feasible in this racetrack setting. Data would have to be collected via surveys and individual interviews. A special T shirt was designed to incentivize participation. The T-shirt was bright yellow with a picture of a light blue 1953 Corvette, reflecting the racing theme.

PRELIMINARY FINDINGS

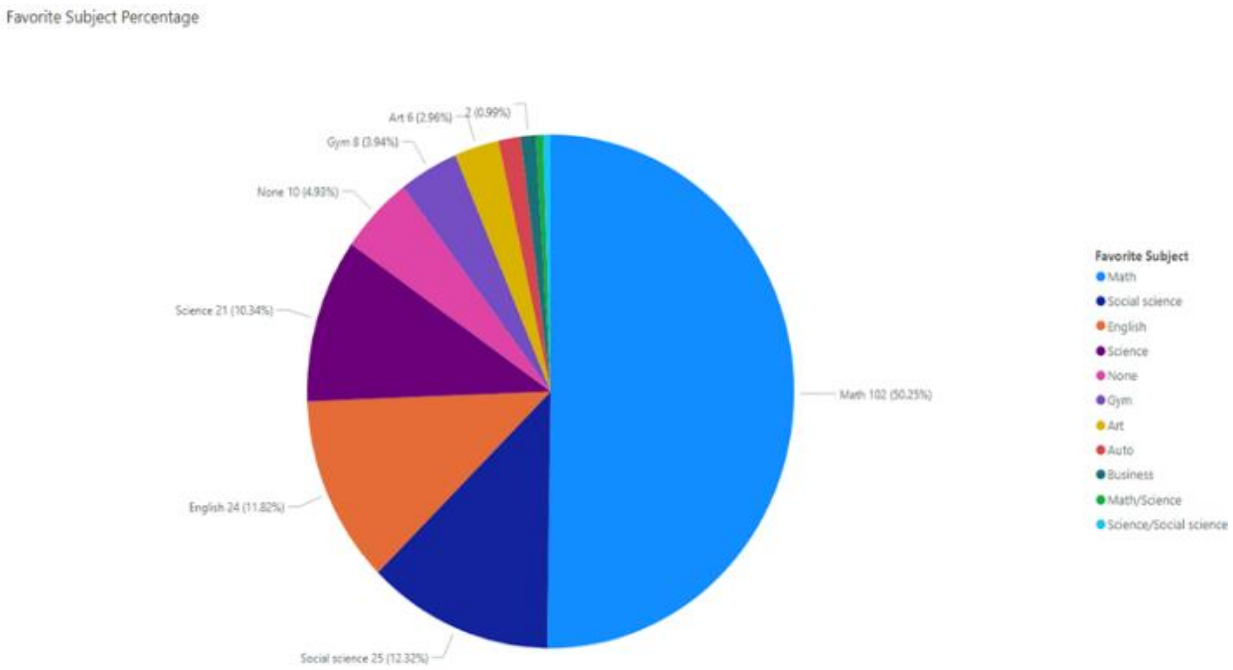
Over three hundred surveys were completed. This is a significant number for a pilot study. At first glance the data suggests that over fifty percent of the Black males surveyed indicated that math was their favorite subject in school. A high percentage of the Black girls that attended the Donk races were there for socialization. The girls seemed to have more interest in “who” was attending and “who” was racing than the vehicles or actual races (Shin, J. E. L., Levy, S. R., & London, B. 2016). However, over 40% over the girls that completed the survey reported math or science as their favorite subject in school.

These numbers are significant when compared with the standardized test scores typically reported for African American students, especially in rural, low-income areas. Test score would suggest that African American students lack interest or proficiency in math and science. Perhaps these scores are misleading. The issue may be subject matter context and classroom delivery. In tangent, math has been documented as a barrier to success in engineering curriculums (Ladson-Billings 2015).The question about interests, aptitude, and self-efficacy emerges for future study as the country seeks to train more engineers to address a national shortage. (Leibowitz, J. B. , Lovitt, C. F. , Seager, C. S. 2,020).

A more thorough data analysis is in process at this writing. The analysis will look for commonalities between favorite subjects in school, plans for higher education, and career aspirations.

The interviews revealed the compelling use of informal language that differed from traditional classroom terminology when drivers and mechanics described the processes they used to modify the Donks or Big Rim vehicles for racing. Their performance exemplified an understanding of aerodynamics, acceleration, material science, chemistry, and continuous improvement, but they never used those exact words. They referred to these concepts as lifting, spinning, track prep, and competition. The conceptual framework for this use of alternative verbiage as documented by Paris, Django (2012).

FIGURE 3
FAVORITE ACADEMIC SUBJECTS OF SPECTATORS



Scholarly Contribution

This study is culturally relevant with respect to informal STEM in an underserved community. The knowledge gained through this study may produce more impactful examples and alternative language to engage African American youth in STEM.

FIGURE 4
YOUNG DONK RACING FANS IN NORTH CAROLINA

CONCLUSIONS

This study has the potential to garner rich detail about African American Donk racing fans' education and career preferences while providing insight to a culturally relevant informal learning setting. More analysis of the data needs to be conducted. This is important as IndyCar and NASCAR are trying to diversify their sectors and fan base. NASCAR has recently partnered with a Historically Black College to diversify the sport. Lessons learned from Donk racing events may be of value to other sectors of motorsports and the broader STEM community. Bottoms, Ciechanowski, K., Jones, K. dela Hoz, J., & Fonseca, A. L. (2017)

FUTURE STUDIES

A larger study comparing the impacts of various motorsports compared to Donk racing may be conducted in the future if data warrants and adequate funding is secured.

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