

**A Day in the Life of Tae:  
A Tenth-Grade Student's Experience with STEM Education  
at Central High School**

Michael R. Ford  
The George Washington University

Michael J. Cox  
The George Washington University

Sharon J. Lynch  
The George Washington University

Ann House  
SRI International

**Author Note**

This work was conducted by OSPrI, research collaboration between George Washington University, George Mason University, and SRI International (Sharon Lynch, principal investigator; Tara Behrend, Barbara Means, and Erin Peters Burton, co-principal investigators). OSPrI (Multiple Instrumental Case Studies of Inclusive STEM-focused High Schools: Opportunity Structures for Preparation and Inspiration) is funded by the National Science Foundation (DRL-1118851). Any opinions, findings, conclusions, or recommendations are those of the authors and do not necessarily reflect the position or policy of endorsement of the funding agency.

Correspondence should be addressed to Michael Ford, Department of Curriculum and Pedagogy, Graduate School of Education and Human Development, 2134 G St, NW, Washington, DC 20052. Email: [mikeford@gwu.edu](mailto:mikeford@gwu.edu)

Suggested citation: Ford, M. R., Cox, M. J., Lynch, S. J., & House, A. (2015) *A day in the life of Tae: A tenth-grade student's experience with STEM education at Central High School* (OSPrI Report 2015-09). Retrieved from George Washington University, Opportunity Structures for Preparation and Inspiration in STEM website: <http://ospri.research.gwu.edu>.

## A Day in the Life of Tae<sup>1</sup>: A 10th-Grade Student's Experience at Central High School

The objective of the Opportunity Structures for Preparation and Innovation (OSPrI) research program is to examine the opportunity structures created for students in both inclusive STEM High Schools (ISHSs) and comprehensive high schools with STEM programs that engage, inspire, and prepare them for STEM fields. In contrast to highly selective STEM-focused schools that target students who are already identified as gifted and talented in STEM, ISHSs and comprehensive high schools do not have strict admission requirements. This inclusivity may serve students in underrepresented groups by providing opportunity structures that they might not ordinarily encounter, as it helps to develop new sources of STEM talent, expand workforce participation, and prepare new STEM professionals.

One of the goals of the OSPrI study was to capture students' perspectives of STEM learning opportunities in both ISHSs and comprehensive high schools. In April 2015, our research team visited one such comprehensive high school, Central High School, a large secondary school in the Midwestern region of the United States. The purpose was to capture how two African American students, one male 10th-grader and one female 11th-grader, experienced their school days. The research question was; *From the points-of-view of students underrepresented in STEM fields, what are the educational experiences and opportunity structures provided by their school?* Two researchers shadowed each student for 2 consecutive school days. We followed the students from the moment they arrived at school to when they left for home, observing them in classes and during informal activities. Two instruments guided the classroom observations. One researcher focused on the class-level activities as a whole, and a second focused on the target student. Using semi-structured protocols, we also interviewed the students and their parents, as well as the administrators, guidance counselors, and teachers. We recorded common themes in the classroom observation notes and transcribed interviews, noting the presence of the 10 critical components in Table 1 (Peters Burton, Lynch, Behrend, & Means, 2014). We also identified a new set of themes that emerged from the students' points of view of the school. After each case study was written, we provided drafts to the principal and participating students to check for accuracy and approve the case. This case study of Tae describes a typical school day in his life.

**Table 1.**  
***Ten Critical Components of Inclusive STEM-Focused High Schools***

Critical Component	Practices Observed
1. <b>STEM-focused curriculum</b>	<ul style="list-style-type: none"> <li>• Strong courses in all four STEM content areas</li> <li>• Engineering and technology offered or intentionally integrated into STEM subjects and non-STEM subjects</li> <li>• More STEM requirements than school district or state</li> </ul>
2. <b>Reform</b>	<ul style="list-style-type: none"> <li>• Active learning; project-based learning or inquiry in STEM</li> </ul>

<sup>1</sup> All of the names used in this case study are pseudonyms.

<b>instructional strategies &amp; project-based learning</b>	<p>classes</p> <ul style="list-style-type: none"> <li>• Incorporation of 21<sup>st</sup> Century Skills into goals and products of instructional practices</li> <li>• Performance-based assessment practices</li> <li>• Research opportunities</li> </ul>
<b>3. Integrated, innovative technology use</b>	<ul style="list-style-type: none"> <li>• Technology an explicit part of school design and implementation</li> <li>• Technology used to connect students with information systems, models, databases, teachers, mentors, and social networks</li> <li>• Technology used for student production</li> </ul>
<b>4. Blended formal/informal extended learning</b>	<ul style="list-style-type: none"> <li>• STEM activities extend beyond the boundaries of a typical school day, week, or year (e.g., afterschool clubs, mentorships, internships; apprenticeships and summer programs)</li> </ul>
<b>5. Real-world STEM partnerships</b>	<ul style="list-style-type: none"> <li>• Students connected to business, industry, and the world of work via mentorships, internships, or projects applied to STEM learning</li> </ul>
<b>6. Early college-level coursework</b>	<ul style="list-style-type: none"> <li>• Flexible school schedule designed to provide opportunities for students to take classes at institutions of higher education or online; college credits accrued</li> </ul>
<b>7. Well-prepared STEM teaching staff</b>	<ul style="list-style-type: none"> <li>• Teachers are qualified and have advanced STEM content knowledge and/or practical experience in STEM careers</li> <li>• Teachers are collaborative and buy into school mission</li> </ul>
<b>8. Inclusive STEM mission</b>	<ul style="list-style-type: none"> <li>• The overarching, inclusive, STEM-focused mission of the school manifests itself in school practices</li> <li>• Active recruiting of students from underrepresented groups</li> </ul>
<b>9. Administrative structure</b>	<ul style="list-style-type: none"> <li>• Varies (school within a school, charter school, magnet school, etc.) and most likely affected by the school's provenance</li> <li>• Networked; able to garner community support</li> <li>• Leadership is mission-centered, nimble, innovative</li> <li>• Flattened hierarchy and shared leadership with staff</li> </ul>
<b>10. Supports for underrepresented students</b>	<ul style="list-style-type: none"> <li>• Systems of advisories, tutoring, and data and communication used to create a personalized education for every student</li> <li>• Extensive college and career counseling</li> </ul>

*Note.* Adapted from “Inclusive STEM high school design: 10 critical components,” by E. E. Burton, T. Behrend, S. J. Lynch, and B. Means, 2014, *Theory into Practice*, 53, p. 1-8.

### **A Day in the Life Tae: A 10<sup>th</sup> Grade Student’s Experience with STEM Education at Central High School**

Central High School (CHS) is a public secondary school (grades 9-12) in the Midwestern region of the United States. The school is located in the suburbs outside a major city. The school is situated in a town of roughly 7 square miles and has a population of approximately 33,000 residents. Looking across the community, the median household income is \$71,201, and 26.1% of students are classified with a low-socioeconomic status (SES). As a neighborhood school, students who attend CHS are representative of their

diverse community, as seen in Table 2. CHS students perform well on the state graduation tests (SGT) when compared to state averages (Table 3).

**Table 2.**  
*Demographic Information of CHS and Central ISD (2012-2013)*

	CHS	Central School District	State
Black	21.4%	20.1%	16.0%
Hispanic	5%	5.1%	4.5%
White	64.6%	64.3%	73.0%
Other Race/Ethnicities	9%	10.1%	6.5%
Economically Disadvantaged	26.1%	28.4%	48.5%
English Language Learner	2.1%	4.0%	2.7%

**Table 3.**  
*CHS State Graduation Test (SGT) Results for SY 2013-2014*

SGT Test	CHS	State
10 <sup>th</sup> SGT Math	89.5%	81.6%
10 <sup>th</sup> SGT Science	88.9%	76.7%
10 <sup>th</sup> SGT Reading	94.1%	88.5%
10 <sup>th</sup> SGT Writing	93.7%	87.2%
11 <sup>th</sup> SGT Math	95.2%	89.6%
11 <sup>th</sup> SGT Science	92.0%	85.8%
11 <sup>th</sup> SGT Reading	96.4%	93.0%
11 <sup>th</sup> SGT Writing	96.0%	91.9%

CHS was founded in 1928. On the main campus, the original high school building still serves students as the primary location for many humanities classes. Adjacent to this building is the Hamilton Building, housing the majority of STEM classes, in addition to some of the school’s more innovative initiatives, including the Distributive Education Clubs of American (DECA), and information technology classes. Connected to the original high school, the Jefferson Building is home to the “Freshman Experience”, a program run by the assistant principal to acclimate freshmen students to high school life. Clark Hall has recently been added to the campus, located across the street. This building is designed to support project-based learning, and houses a variety of collaborative learning spaces. Intended to be a shared space, it also holds some community college classrooms and a YMCA.

Athletics are an integral part of the school’s identity, with approximately 800-1,000 of the school’s 2,400 students participating in a varsity sport. CHS teams have had a long history of success that extends back several decades, including dozens of district and conference championships, and several junior Olympians. Opportunities also abound for students to get involved in activities other than athletics. The school has over thirty-six clubs including clubs for astronomy and rocketry, computer programming, and underwater robotics.

The abundance and diversity of activities available at CHS reflects the school's mission to help its students succeed in all aspects of life after graduation. CHS has a career center with marketing and IT programs, a digital online academy, a dual enrollment program for students to earn college credit, and a DECA program, where students can gain business experience by initiating marketing campaigns for local businesses. Additionally, in 2015-16, the school plans to open a Fabrication Lab, a program with business classes and internship opportunities with local companies for students who wish to enhance learn about engineering or develop technical skills.

CHS students have a strong record of college preparation. The school offers a wide variety of Advance Placement (AP) courses, and the students who take advantage of these offerings tend to perform very well; 75% of the 439 AP tests taken by CHS students in 2014 received a score of 3 or higher. Moreover, 76% of students took the ACT—the admissions test of choice for most CHS students in this Midwestern state.

### **Meeting Tae**

We met Tae in April, 2015. Tae typically starts his school day by waking up at 5:30 am. Similar to most teenagers forced to rise at this hour, Tae has several alarms on his phone, each one separated from the next by about five minutes. After getting out of bed, Tae gets his clothes, goes downstairs to eat, and then rushes back upstairs to get his backpack ready for school. Tae has to be ready for the bus at an especially early hour because he is one of the first stops on the route. This means that after getting picked up at 6:20 am, he has at least a forty-minute commute to school ahead of him.

Tae is a sixteen-year-old 10<sup>th</sup>-grader at Central High School. He is African-American, with a fade-afro haircut with orange tips. Today, he wore an orange shirt with black and grey colored camo pants, and basketball shoes. Standing at 5'7", he has a lean, muscular build that reflects his passion for track. Tae comes from a very athletic family; his thirteen-year-old sister competes in track, basketball and volleyball, while his ten-year-old brother plays basketball. His father—a person whom both Tae and Tae's mother described as a role model for Tae—is a former track star who competed at the Deaflympics.

Tae and his family moved to the area seven years ago when Tae was in the 5<sup>th</sup> grade. Tae and his siblings were born in a nearby city and they attended a private elementary school where Tae excelled at science and math. After moving, Tae enrolled in Central High School, his neighborhood school.

Tae's first language is American Sign Language because both of his parents are deaf. When asked how growing up in a deaf household affected his life, Tae answered that he tends to talk with his hands more often than other kids. When Tae is around his family, he uses sign language because of his parents' preference for it, over reading lips.

According to his mother<sup>2</sup>, Tae's father has had an outgoing and friendly nature that has had a big impact on Tae's development. Growing up watching sports, constantly meeting people, and spending a lot of time around his energetic father seemed to have really made an impact on Tae. Tae loves to talk and be around people. His mother said that she could definitely see him working in the media, adding,

*And so when I'm looking at it, I see like he's very social and he likes to be around people so, I don't know, why couldn't he be a speaker or someone on TV? I think that might be something that he could be involved in.*

Tae's thoughts about his future were consistent with his mother's assessment. He said that he either wants to go into business and sell things, or be on TV and talk to people. Tae's favorite class in school is his Introduction to Business class because the work is more interactive than lecture-based. Based on his experiences in this class, he thinks that he either wants to study broadcast journalism or business in college. Tae said that he is already taking steps to put himself in the best position to continue to have both career options available. For example, Tae has arranged a television internship over the summer and he also plans to shadow his aunt, a real estate agent, on a typical day of work, to observe her business firsthand. During his senior year, he also plans to join DECA—an international organization of high school students that compete in business competitions.

When asked about his college plans, Tae said that he intends to go to the best college that would offer him a track scholarship. Although Tae has his sights set on a Division I school, his mother said that she would prefer he go to a Division III school so that he could benefit from smaller classes. Since Tae already has good relationships with his teachers, his mother liked the idea of Tae getting to know his professors well in college.

Track is clearly Tae's athletic passion, and consequently takes up much of his after-school time. His schedule after the last bell at 2:50 pm usually consists of lifting weights until 3:30, followed by track practice until anywhere between 4:45 and 5:30 pm. He finishes his day with another thirty minute lift, allowing him to get home around 6:00 or 6:30 pm, with a ride from his parents. Tae mentioned that he often finds time before school, during study hall, and during classes to finish homework assignments, allowing him to devote a sizable portion of his day to athletics. Because Tae mostly finds time at school to do his homework, he only has about thirty to forty-five minutes of homework to complete when he gets home. He showers, eats dinner with his family, and finishes whatever homework assignments he didn't complete during the day. He also takes some time to relax, typically opting for using his phone to browse social media. He usually gets to bed around 9:30 or 10:00 pm, except on days he has track meets when he get to sleep around 11:00 pm or later.

Along with his passion for athletics, which includes track, basketball, and football, Tae has a diverse set of interests. Tae reports that he is really good at chess, but is not sure if

---

<sup>2</sup> The interview with Tae's mother was conducted using an American Sign Language interpreter. The quotes used in this narrative were translated from American Sign Language to English on April 21, 2015.

he's good enough to join the chess team. Joining the team is something that Tae aspires to do soon. Tae is also part of a service organization composed of young black men from CHS. The group supports Tae by helping him improve all aspects of his life including his character, his grades, and even how to dress. Additionally, Tae attends church with his family every Sunday.

In the classroom, Tae's teachers describe him as a pleasure to have in class. His biology teacher said that he has an "interest and aptitude for science," and is a very social, outgoing student who isn't afraid to ask questions in his class. "[He is] comfortable in his own skin, both with adults and with his peers." This teacher described Tae's performance on the day of our visit to give us an example of his overall perceptions of Tae as a student:

*...he asks questions, he sits up at the front this quarter, and he was engaged with his lab group, and as I was circulating around and went by there, he was right in there, talking and throwing out ideas with them. It was typical.*

Tae's mother reported that Tae doesn't shy away from getting any help he needs from his teachers and tutors; he is generally very proactive about his schoolwork.

Tae thought that the CHS is "cliquey", but many students enjoy membership in multiple friendship groups. For example, students may hang out with people in their own ethnic/racial group, but also venture outside the boundaries of this group to hang out with people who share an interest (e.g., members of an athletic team). Tae has been able to circumvent the school's cliques by generally being friendly to everyone. Tae cited his gregariousness as a potentially useful trait if he were to choose a career in broadcast journalism. He explained,

*I like going around to everybody because I would like to be friends with everybody because I know that might help me because I like to talk to people. So, like in the news thing, you have to talk to everybody so you have to get to know everybody, so I like to do that.*

As Tae walks through the halls between classes, he seems to have a friend around every corner, ready to give him a high-five. In classes, Tae always has a friend or two to sit with and walk with him after class. Tae seemed to be viewed as a friend to everyone and was well liked by both his peers and teachers.

## **Tae's Day at Central High School**

### **Period 1, Introduction to Business: Presenting a Business Plan**

Tae's first period of the day was Introduction to Business. The class was located in a computer lab equipped with both desktop computers and a laptop cart. The teacher played country music as students entered the room. As they entered, students got laptops from the laptop carts along the front of the room and sat down at large tables that filled the

center of the computer lab. Tae sat at a large table near the back of the room with three other students, two boys and one girl. Once the students got settled, the teacher turned down the music and reminded them that they would be presenting their business plans, developed in groups over the past two weeks. The students were told that they would be graded individually on four aspects of their project: (a) the presentation, (b) knowledge of their product and business plan, (c) the visual presentation, and (d) delivery of their presentation.

After another group went first, Tae's group presented their business plan for a carryout business called Dine N' Dash, specializing in delivery service for restaurants without it. The presentation covered several topics including business goals, an operational plan, a marketing plan, survey research from the school, projected businesses expenses, and a commercial that the group had developed and uploaded to YouTube. When it was Tae's turn to present his portion, he read the text off the PowerPoint. Overall, the business plan was well received by the class, who laughed at the commercial the group had developed and posted on YouTube.

The lesson flow observation revealed that in this class, 91% of class time was spent on task. Regarding the class structure, 89% of class time was teacher centered, with much of this time being used for students to present their group projects. 11% of the class time was in small groups, as students were preparing to present. No time was spent on individual seatwork. The lesson flow data does not necessarily mean that every student used time in this way, but describes the class structure as a whole.

The next day, this class started with Channel One, a daily news program, broadcasting in the corner of the classroom from a small television set. Students trickled into the class, getting organized for the day and retrieving laptops out from the laptop cart. Tae sat with his project group at the same table they used the day before. At the conclusion of the broadcast, the teacher instructed the students to go to his website to fill out an online survey that would help select the next unit to be addressed in the course. Students had a choice between international business and business ethics. While completing the survey, some of the students raised their hands and asked the teacher, "What is business ethics?" He responded, "It's like doing the wrong or right things. Like how we view Nike and how we look at how their business is perceived." Students completed their online surveys and the business ethics topic was selected overwhelmingly.

The teacher then directed students to log-off their computers and return to the business plan presentations begun the previous day. The remaining presentations included a restaurant serving gourmet soul food, a gourmet ice cream shop, "cakes in jars", and foam armor. During the presentations, Tae rested his head on his desk, but seemed to be paying attention. Tae and the rest of the class were quiet, seemed attentive, and laughed at the YouTube commercials that the groups created. The class members easily chattered between presentations. At the end of the period, the teacher wrapped up class by reminding students to submit the individually written portions of their business plan.

In this class, lesson flow showed that 100% of class time was spent on task. Regarding the class structure, 100% of class time was teacher centered, with much of this time directed toward the group presentations. No time was spent on individual seatwork.

## **Period 2, Study Hall**

Tae entered his study hall and spent the first few minutes on his phone, putting it away when the morning announcements started. Students were able to use this time to work on their homework or meet with one of their regular content teachers. Tae spent much of this time on his phone and socializing with other students. In a student interview that was conducted during the study hall period the following day, Tae stated that he usually does his “morning homework throughout his classes, study hall, and then whatever I have left, I do it at home.” He estimated that he typically has about thirty to forty-five minutes of homework a night. At the end of this period, Tae packed up and headed to his next class, Biology.

## **Period 3, Biology: The Great Fossil Find**

Tae’s next class was on the other side of the school. As he entered the large biology classroom, soft acoustic guitar music was played from the teacher’s computer. After morning announcements the teacher described the learning target for the day, which was “I can describe evidence for evolution.” He handed out a worksheet for a laboratory activity titled, “The Great Fossil Find!” To begin the activity, the teacher showed the class several fossils that he had hanging up around the classroom and modeled how students should be talking and thinking when engaging in the lab activity. The teacher placed students into groups of 3-4 students. Tae was in a group with two other boys who were sitting nearby. They turned their chairs and huddled around one table, read the first part of their lab protocol, and began working their way through the lab.

The lab consisted of a series of envelopes that contained paper cut-outs of fossilized bones. For each envelope, Tae and his group dumped the “fossil parts” onto the table and discussed how these bones might connect, what types of bones they might be (e.g., leg bone, arm bone, chest bones), and the possible type of animal that they came from (e.g., reptile, bird, mammal). Tae’s group seemed engaged throughout the activity; they completed the steps and filled out the worksheet that guided the lab.

Next, the teacher handed each group an additional envelope containing more paper cut-outs of their animal’s bones, requiring the students to revisit their previous assumptions. Looking at the new bones, Tae exclaimed, “Wow, I really have no idea what animal this is now. They [the bones] don’t even look the same [as the bones from envelope one].” Tae then began to connect them to construct a new animal, “Maybe it is an alligator? Or a mermaid?” A boy in his group responded, “My gosh! Relax. It is not a mermaid, Tae.”

After arranging the bones the best they could, Tae’s group decided that they had a reptile, or perhaps a bird. The teacher then concluded the lab by saying, “One of the things I really like about this is that it patterns the way science works in real life.” He continued,

*The conclusions you made on day 1 [after the first envelope] are different than the conclusions you made on day 2, 3, or 4 because you got new information. This is how real science works. People say scientists don’t know what they are talking*

*about. That is not true. They get new information and they have new understandings. That is how real science works.*

The teacher then directed the students to clean up. The teacher revealed that the animal they constructed was a “pterosaur” (a kind of pterodactyl). While waiting for the bell, students then watched a quick YouTube video of what scientists think a “pterosaur” might look like.

In this class, lesson flow showed that 92% of class time was spent on task. Regarding the class structure, 30% of class time was teacher centered and 70% was small group centered. No time was spent on individual seatwork.

The next day the learning target was “I can draw a phylogenetic tree.” The teacher provided a note sheet for students to fill in while they listened to a lecture on the different kinds of evidence for evolution: fossils, embryology, anatomy, development, and DNA. During this lecture, Tae filled out his note sheet, and at one point raised his hand to ask a question about tailbones, a vestigial feature of humans. He asked, “You know how we have a tailbone? Does that mean humans had tails back in the day?” The teacher’s response was that, “Monkeys and humans do have a common ancestor that had a tail.”

The teacher then showed students some examples phylogenetic trees and how to draw one, guiding students step-by-step through the process, answering questions as he went along. Students worked on this assignment independently as the teacher provided individual help. Some of the students worked on this assignment, but many, like Tae, chose to socialize instead. He chatted with students about getting a driver’s license. Tae did not have his license nor had he signed up for driver education, although he intended to do so in the summer. Tae and his friends talked about this topic for the rest of class and then packed up and headed off to their next class.

All of the time in this class was spent on task, as noted in the lesson flow. Regarding class structure, 64% of class time was teacher-centered, 18% was spent watching the video announcements, and 18% was spent on individual seatwork.

#### **Period 4, Algebra II: Introduction to Trigonometry**

Tae’s next class was Algebra II. In this class the math teacher was assisted by a special education teacher who worked with five students with individual education plans (IEPs), as well as any other student who might need help. Tae immediately began to chat with some of the students who sat around him. Desks were organized in rows in preparation for an upcoming quiz. Tae began to work on the quiz using a pencil and his TI-84 calculator, purchased by his family. The mathematics teacher later told the researchers that most students purchase their own TI-84 calculators, but that the school district provides them to families without the financial resources.

Some of the students finished the quiz quickly, but Tae spent 20 minutes on it, more than most students. Afterwards, some students began a worksheet, but many chose instead to

talk amongst themselves, or were on their cell phones. Tae spent the fifteen remaining minutes of class chatting with two girls who sat behind him. Eventually one of the girls moved her desk closer to Tae so that they could watch videos together on his cell phone until class was over.

All of the time in this class was spent on task, as noted in the lesson flow. The teacher had intended that students spend the last segment of class completing a worksheet, but Tae and many other students chose to socialize for the last fifteen minutes instead. Regarding class structure, 11% of class time was teacher-centered and 89% was spent with students directed to do individual seatwork, which included the quiz and worksheet.

The next day, the desks were re-arranged into groups of four. Tae and another boy were discussing a fight that had occurred between two girls in the school and was caught on video. The teacher warned the students not to put it on Twitter because they could get in trouble. The classroom continued to buzz, but eventually quieted down. The teacher listed trigonometry formulas on the board that students could use to find theta ( $\theta$ ) using sine, cosine, and tangent. Seeing Tae was on his cell phone, she spoke sharply, "Tae will you stop looking at the fight!" He responded, "I am not! I am watching a video of someone who walked into McDonalds and made their own french fries!" The entire class laughed, including the teacher and the trigonometry lesson continued. This lesson appeared challenging to some students, but Tae seemed to grasp the concepts easily. He worked independently on his worksheet, while the teacher answered student questions. After completing his worksheet and checking his answers against a key, Tae spent the last few minutes of class chatting with a few friends and playing with his phone.

In this class 64% of the time was spent on task. Regarding class structure, 73% of class time was teacher-centered and 27% was spent on individual seatwork.

### **Period 5, French II: Conversing in French**

Tae's French II class was a long hike from Algebra II, two buildings over and on the third floor. Even after walking directly to the classroom, we arrived a minute late to a classroom with a homey feel, a carpeted floor, curtains, and two bright yellow walls. The desks in the class were arranged in a U- shape. The teacher greeted the class and asked them to begin the warm-up on French grammar, apologizing for giving them hard copies because the projector wasn't working. As they reviewed the answers, Tae volunteered an answer and the teacher corrected the verb tense in his response.

Next, the teacher started the day's lesson which involved students conversing in French in response to a list of technology related questions provided by the teacher, in a whole-class conversation. The teacher facilitated the conversation by asking clarifying questions about their comments and helping students find the right words to speak to one another. To encourage participation, students placed a small square of yellow paper on their desks each time they contributed to the conversation. Tae contributed twice to the class conversation, once answering a student's question with a comment, and another time asking a question of his own.

All of the time in this class was spent on task. Regarding class structure, 11% was spent on individual seatwork and 89% was teacher-centered. The majority of the teacher-centered instruction occurred during the whole-class French discussion facilitated by the teacher.

The second day of French II was a review session with the desks arranged for small groups of 3 or 4 students. Tae sat with one boy and one girl. The class consisted of two review games. For the first review game, the teacher asked each student to translate a list of verbs into English, timed by the group members. Tae looked over his paper and reviewed quietly by himself. After a minute, he stretched, and called the teacher over to clarify the meaning of “sortir” on his list. The teacher responded, “Yeah, it’s ‘to go out.’” Tae chose to be the timer in his group and the girl at his table went first, completing her translated list in 45 seconds. Tae and the other boy were impressed, and joked that they would take much longer. They were right. Tae finished in 1 minute and 45 seconds. After competing within their small groups, the winners from each group continued onto a finals round with the entire class. The girl in Tae’s group won the challenge for the entire class.

For the second review game, each person in the classroom was given a giant die to roll. On a whiteboard, each number of the die (1 to 6) corresponded to a question that the students had to answer. Tae’s question in French was, “If you had 1 billion Euros, what would you buy?” Tae responded in French that he would buy Kim Kardashian and the class laughed. At the end of this activity, students packed up and headed to their next class.

All of the time in this class was spent on task. Regarding class structure, 78% was teacher-centered and 22% was small groups.

### **Period 7, U.S. History: Civil Rights Movement**

Tae’s next class was U.S. History. He sat with a large group of boys, chatting until the start of class. The day’s class consisted of a lecture from the teacher on civil rights, including Malcolm X, the voting rights act, and the riots related to the civil rights movement. Throughout this presentation, Tae seemed attentive and engaged, occasionally commenting to his friend sitting next to him. After his lecture, the teacher started a YouTube video that covered the famous riots related to the civil rights movement leading up to the Civil Rights Act of 1965. During the video, Tae seemed attentive, occasionally talking to his friends.

All of the time in this class was spent on task, as noted in the lesson flow. Regarding class structure, 100% was teacher-centered, with the teacher lecturing and show in a YouTube video on civil rights.

The next day, the teacher started the class by telling the students that they would need to “shift gears a bit today.” He passed out a review sheet that reviewed the student learning objectives (SLO) for the course in preparation for the upcoming SLO test. The test would not count as a grade, but would be an opportunity to earn extra credit. The SLO review

sheet consisted of 40 terms for students to define. Students had the entire class period to work on it. Most of the students worked on these question on and off for the entire period. Tae did work on the review sheet, but he spent most of his time talking to other students. He talked to a girl that sat next to him, and they looked at pictures on her iPhone. Later on in the class period, Tae started working on his review, but was frequently interrupted by his male classmates who were talking about their experiences with the behind the wheel portion of their driver education classes. By the end of class Tae had defined only 8 of the 40 terms on his review sheet

In this class, 90% of the time was spent on task. Ten percent of the time was teacher-centered and 90% of the time was intended to be individual seatwork for students to work on their SLO review sheets.

### **Period 8, English: *Me and Orson Wells***

Tae's last class of the day was English. He took the teacher's desk and chatted with his friends. When the teacher came in and saw Tae at her desk she joked with him and eventually told him to take a seat at the front of the class. She reminded the students that they had their standardized testing and reporting (STAR) reading assessment tomorrow, which would, "show how much you have learned in English since you last took the test in September." She emphasized that the students should be quizzing each other during study hall so that they could learn the necessary vocabulary to do well on the STAR reading assessment. Today the class was watching a segment of the movie *Me and Orson Welles*, released in 2009. The class had been alternating between reading the novel by Robert Kaplow and watching the film. Most of the class watched the movie quietly, while some students worked on classroom desktop computers finishing a prior class assignment. Tae watched the film quietly, resting his head on his arms folded across his desk. The movie ran until the end of the class period. Tae had a track meet at another school on this afternoon, so after class he headed out to board a bus with his teammates to go to another school for the meet.

The lesson flow showed 90% of the time in this class was spent on task and 100% of the time was teacher-centered (watching the film).

The next day students in English class took the STAR reading assessment, which was organized into five domains: (a) world knowledge and skills, (b) analyzing literary texts, (c) understanding the author's craft, (d) comprehension strategies and constructing meaning, and (e) analyzing argument and evaluating text. This was the third time this year that Tae had taken this test. The testing occurred in a computer lab within the school's media center. The students were instructed to login to the computers using their student ID and password. The test took Tae about 25 minutes to complete. At one point Tae said to his teacher, "I am going to take my time, I am not going to miss no questions [sic]." Tae found out immediately after finishing the test that he passed his STAR reading assessment and that he had improved each time that he took the test, ranking in the

middle third. The bell rang for the end of the school day and Tae headed off to track practice.

All of the time in this class was spent on task and 100% was spent on individual seatwork with students completing the STAR reading assessment on the computers.

### **Conclusions and Implications**

As seen through the eyes of Tae, CHS could be described through the dual lenses of sports and academics. The school was renowned for its athletic programs, which focused on the academic, social, and physical development of student-athletes. Tae was on both the football and track teams, and planned to go to college on a track scholarship. The athletic director at the school had been very involved in Tae's physical and academic development, often advising him. As Tae explained, the athletic director would "kind of help you with figuring out, like, what colleges and stuff that you might want to apply to if you wanted to try to get a scholarship." But this extended beyond just college advising. The athletic director said that he also monitored the academic progress of his athletes through "careful conversation with parents and the student athlete" about "managing both their athletic and academic curriculums." At CHS, student athletes like Tae had to balance their academic desires and interests with realistic grade expectations so that they would have good standing in the NCAA clearinghouse, a tool used to recruit college-level athletes.

### **What did Tae Learn?**

What stands out from Tae's experience at CHS was the number of options that he had to pursue his varying interests. Tae stated that he wanted to go "into business and start selling things" or "be on TV and talk to people," and his school has effectively provided the avenues for Tae to pursue both interests through courses and extracurricular activities. For example, next year Tae has made plans to do an internship in TV so that he can "get in there and know what to do." Another example is the school's underwater robotics team. Tae expressed interests in the robotics club saying, "I was thinking about getting into robotics because I think that'll be a real cool thing and I feel like that's going to be more up in demand in the future."

CHS also gave Tae the opportunity to pursue his other interests through the school's numerous course offerings. Tae enjoyed having the freedom to customize his coursework, and discussed how he would take college-level coursework when he had the opportunity. For example, next year 11<sup>th</sup> grade he was considering taking an AP Psychology class because he was "thinking about getting into the psychology field, too" and an AP Environmental Science class.

In the small sample of classes observed, instruction in math and science courses were led using traditional teaching strategies. Teachers lectured and then provided students with opportunities to grapple with the content through individual practice with worksheets or a group laboratory setting. In contrast, the business class was structured in a project-based format where students created a business plan, collected data, and presented it to the

class. In this business class example, there was no “correct” answer to the project. Rather, Tae was able to construct knowledge and skills through this open-ended project. Tae felt that he learned better through this approach. He reported that he enjoyed, “being active in what I’m doing...because I like doing hands-on things more than just listening to it and everything.”

Overall, Tae said his classes were valuable and he felt they were preparing him well for college and career. He believed that his science class was “preparing you for, like, the future things that are going to happen, and like more science and technology” and that mathematics was preparing him for future business courses that he wants to take in college.

### **What was School like for Tae?**

For Tae, his life at CHS seemed to revolve around track and football. He woke up early and wouldn’t often get home until 6:00pm or even later if he had track meets or football games. The time he spent dedicated to training for these sports left little time in the evenings for other activities or homework. Tae said that his friends didn’t usually “hang out” in the evenings because he saw them during the day and at practice or games. Tae found his niche at school playing sports, and invested several hours a day developing his track and football skills.

In class, Tae was a very active and social student who consistently attracted positive attention from his peers and teachers. In class he regularly participated in classroom discussion and activities, but he also spent much time socializing with his friends. Most people seemed to enjoy Tae, including his teachers. Tae reported that “all my teachers like me a lot.” He felt comfortable with his teachers and felt that he could confide in some of them.

### **Where will Tae’s experience at Central High School Take Him?**

At CHS students were presented with a variety of options and it was up to the individual students to choose the classes and activities that aligned with their interests. For Tae, CHS was a good fit. As a student athlete, Tae was well supported academically, socially, and in his athletics. However, Tae reported that while challenges at school were not a problem for him, some students may need more “one-on-one attention” due to the size of the school. The athletic director is aware of Tae’s interests to pursue an athletic college scholarship and is assisting Tae in navigating through high school so that he will be well prepared in the college admissions process. At home, both academics and athletics are a priority. Both his parents have stressed the importance of a college education, and Tae has exemplified these values in his discussions about career choices. Tae has thought about his future and is pursuing a variety of possible career interests (i.e., psychology, media, and business). He understands that a college education will be necessary for all of them.

After spending two days with Tae, it seemed that he will be prepared to succeed in college. Tae shared with us his multiple career aspirations and we have learned that he is well supported in exploring these aspirations through his family's social network and the many opportunities that he is taking advantage of at CHS. Furthermore, his teachers and athletic director had guided Tae and had provided him with personalized support to navigate the multiple opportunities and options that CHS has to offer. As a result, Tae is well positioned for life after Central High School.