Executive Summary

Mississippi School for Mathematics and Science
State Schools of Mississippi

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Introduction

Every school has its own story to tell. The context in which teaching and learning takes place influences the processes and procedures by which the school makes decisions around curriculum, instruction, and assessment. The context also impacts the way a school stays faithful to its vision. Many factors contribute to the overall narrative such as an identification of stakeholders, a description of stakeholder engagement, the trends and issues affecting the school, and the kinds of programs and services that a school implements to support student learning.

The purpose of the Executive Summary (ES) is to provide a school with an opportunity to describe in narrative form the strengths and challenges it encounters. By doing so, the public and members of the school community will have a more complete picture of how the school perceives itself and the process of self-reflection for continuous improvement. This summary is structured for the school to reflect on how it provides teaching and learning on a day to day basis.
Description of the School

Describe the school's size, community/communities, location, and changes it has experienced in the last three years. Include demographic information about the students, staff, and community at large. What unique features and challenges are associated with the community/communities the school serves?

Since its founding in 1987, the Mississippi School for Mathematics and Science (MSMS) has served as a flagship of learning for the state. The school is located on the campus of Mississippi University for Women (MUW) in Columbus, Mississippi and, although it shares some facilities and services with MUW, is a separate educational entity. Graduates excel in institutions of higher learning across Mississippi and the nation, and have become leaders in the communities in which they live. MSMS' mission and beliefs statements reflect the dedication to the 240 students who enroll every year, and the wide-ranging communities it serves.

MSMS has four main administrative offices: the Executive Director, who performs tasks similar to those of a small college president or a district superintendent; the Director for Academic Affairs, whose responsibilities resemble those of a college dean and high school principal; the Director for Student Affairs, who oversees residential life, student activities, evening studies, and contractual services (food service, health, security, etc.) and coordinates the exchange of information between the school's residential component and its academic one; and the Director for School Advancement, whose duties include recruiting and admitting students, coordinating public relations, providing leadership for outreach and writing grants. There are twenty-three faculty members, two counselors and numerous office and residential staff. All faculty and counselors hold at least a masters degree. Eight hold doctoral degrees, and eight faculty members hold National Board Certification.

All students must be Mississippi residents; however, there are no admissions quotas regarding gender, ethnicity, or home district. Strong efforts are made to enroll a diverse student body representing all regions of the state. Currently, 228 students are enrolled in the school--122 are juniors, 106 are seniors. The population includes 95 males and 133 females. By ethnicity the student body is 58% white, 28% black, 12% Asian, and 1% Hispanic.

MSMS is essentially a one-school district, but because it enrolls students from around the state, it cannot levy a millage tax to cover costs. The state must take care of the school's financial need. Currently, MSMS charges $500 per semester for room and board; other required fees amount to $195/yr, and optional fees can add another $265-$465. The MUW Office of Finance provides monthly financial reports to MDE and the MSMS Executive Director. The office of the Executive Director monitors spending within the school's accounts, which include budget categories for salaries and wages, fringe benefits, capital outlay, travel, commodities, and contractual expenses. Approximately 20% of the school's budget is paid to MUW for the services it provides.

MSMS has the physical resources needed to guarantee an active learning climate. It has three academic buildings: Hooper Science Building, where most classes are taught and where most faculty have their offices; Shackleford Hall, where social sciences, computer programming and art studio classes are taught, and where those faculty have offices; and the Performing Arts Center, a former laundry building where performing arts classes are taught, and where the music director has an office. MSMS has one administrative building of its own, the Mary Wilson House, which is home to the Executive Director and his staff. MSMS shares some administrative space in MUW's William Hogarth Student Center, for the Directors of Residence Life and of School Advancement and their staffs.

MSMS shares a number of facilities with MUW. MSMS students use the cafeteria, bookstore and post office in Hogarth. MSMS students use two dormitories, Frazer for boys and Goen for girls. MSMS students also have access to the Stark Recreation Center and to various fields for
exercise and athletic activities. MSMS students conduct college-level research at MUW's Fant Memorial Library, and make use of the professional services of librarians there. Requests to use auditoriums and other large meeting spaces must be scheduled through MUW's Facilities Management. The City of Columbus allows MSMS to use its regulation soccer fields when available; however, scheduling for practice as well as for games is often difficult due to high usage and demand.

Other sources of funds for the school include the MSMS Foundation Board, the school's Partners in Progress, and additional grants. Funding for more substantial projects must be requested from the legislature through the Mississippi State Board of Education. Administrators keep an open ear from all stakeholders regarding such needs, but their ability to meet them is limited by what the state allocates. The school's budget has dropped approximately 15% over the last three years. Every daily act, as a result, has been scrutinized to see where school leaders can save money. The administration solicits requests from faculty for the improvement of resources at the beginning of every school year. This process is known as the “Needs, Wants, Wishes” list, and once administrators prioritize it, they request funds from our parent organization, Parents Lending United Support (PLUS).

The school's residential environment promotes student learning and future success by helping students organize their interests and energies in a controlled, academic setting. One of the first things students realize upon arriving at MSMS is that they are surrounded by peers who are just as interested in learning as they are. They stay up late to talk about discreet mathematics, or to discuss Hamlet's Oedipal complex, or to design more aerodynamic minivans. MSMS is also an incredibly diverse school. Living and learning with other students from so many different cultures and ethnic groups does much to broaden their vistas.

MSMS' residential life component also separates it from traditional high schools. MSMS students learn how to balance their academic schedules with other interests. Although the school's residential life staff helps students when they stumble in some way or another, MSMS students are forced to become more responsible than a typical high school student. One important component of this process involves the school's work service requirement. Every MSMS student must complete up to two hours of work service—which is either custodial or academic, depending on the student's standing—per week. This obligation helps reduce the cost of such services to the school, and imparts to students an awareness of the responsibilities of its upkeep.

Finally, as students come to recognize the importance of responsibility in their personal and academic lives, they are given a high level of governance through the Student Government Association and the Student Judicial Court. This court reviews disciplinary actions for non-academic Level I and II violations. It determines whether or not the violation is under its jurisdiction, whether or not the violation actually occurred and whether or not the punishment was fair.
School's Purpose

Provide the school's purpose statement and ancillary content such as mission, vision, values, and/or beliefs. Describe how the school embodies its purpose through its program offerings and expectations for students.

Unlike most high schools in Mississippi, the Mississippi School for Mathematics and Science has a legislatively mandated purpose, as stated in MS Code § 37-139-9: "the purpose of the school shall be to educate the gifted and talented students of the state, and its curriculum and admissions policies shall reflect such purpose." The code also declares that "emphasis of this school shall be dedicated to the academic teaching of mathematics and the sciences, but shall not preclude some emphasis being placed on the arts and humanities as deemed appropriate by the board." Indeed, student learning results, as measured by college placement and ACT scores, indicate that the school has created high expectations for student learning, and that the school's various stakeholders have met that charge. The school's mission statement--MSMS cannot, technically, revisit its purpose statement without going through the legislature--focuses on preparing the state's best students academically and offering a model for excellence in Mississippi public education:

Our mission is to enhance the future of Mississippi by providing innovative learning experiences in a residential environment to meet individual needs of gifted and talented students and by providing quality educational leadership and aggressive outreach programs.

We believe that MSMS
- addresses the extraordinary needs of Mississippi's gifted and talented students through innovative and rigorous research-based courses;
- teaches students how to integrate technology with current content in courses;
- offers a living-learning environment that facilitates students' intellectual growth, encourages their social maturity and self-confidence, and strengthens their citizenship;
- stimulates excellence in all Mississippi schools by providing a model of educational leadership; and
- courts active participation from all of the community's stakeholders.

To ensure participation from stakeholders beyond the faculty, staff and students, the school keeps lines of communication open to parents in a number of standard ways: email, listservs, mailings, Internet, telephone and fax.

However, the school's successes in creating a living-learning environment have not consistently been the result of implementing a comprehensive process for reviewing and revising goals so much as a general adherence to the belief that good students become great students when challenged.

Strengths
From the moment that students choose to enroll at MSMS, they are encouraged to see that the school exists to offer them rich academic experiences that focus on the mastery of content in a wide array of courses. Students undergo five days of indoctrination before their classes begin; the first week is capped off by the school's Ceremony of Lights, which underscores the importance of respecting the ethical and intellectual pillars of the school: community, creativity, scholarship, and service. Once their classes begin, they must reckon with the demands placed by faculty who stress critical thinking/critical learning skills in a collegiate environment: the school is residential, and courses are offered on a MWF-TTh schedule. Teachers make their syllabi and course schedules available to parents and students alike; parents and students can use these documents to see what their children are learning, and can monitor progress on PowerSchool.

The diagnostic tools offered by AdvancEd, and in-house surveys of students and alumni, point to the efficacy of teachers at MSMS as contributing in large measure to the culture of academic achievement at the school. Several faculty have their terminal degrees; three
quarters of the faculty members have been at the school more than five years; faculty take pride not only in their own levels of content mastery, but also in their ability to share what they know. Faculty also contribute much to school life outside of the classroom, which is essential given the school's residential nature and its emphasis on individualized learning. Every faculty member sponsors at least one club; some sponsor as many as four or five. Each faculty member comes back to campus one weeknight for evening tutorials. Faculty members regularly attend student plays, recitals, dances and other functions, and make an effort to show students that the critical thinking done in the classroom has real world analogs.

Finally, despite the economic downturn and 15% cut in the school budget, the school has significantly improved its technology backbone and equipment thanks to grant funding through the MSMS Foundation, the Appalachian Regional Commission, and other sources. Lack of funding is still a major issue and has resulted in the reduction of staff and faculty positions, as well as in the number of students who may be admitted.

Areas for Growth
Although teachers stay at MSMS for large portions of their careers, administrative offices have been veritable turnstiles. The school has four administrative positions. In the last five years, each of those positions has experienced turnover; the five years prior saw much of the same. This may result from low administrative salaries making it hard to retain highly qualified leaders. The 2008 review identified this problem, but no action was taken. As a result, although teachers have done a good job of perpetuating a culture of academic achievement, their efforts have been atomized: administrators haven't stayed long enough to direct substantive improvements, or to reflect on the systems at the school that already work in order to find ways that anneal them. Like many schools in Mississippi, MSMS has also felt the pinches resulting from a contracting economy and a lack of sufficient funding from the legislature. Our budget is but a fraction of what our sister schools in neighboring states get. While we recognize that the per student cost of MSMS more than doubles the amount at regular schools, regular schools don't have to pay for students' room and board, or for their round-the-clock care. Moreover, MSMS cannot request a millage increase because students from around the state attend the school. We are dependent on what the state gives, and on donations to our foundation.

Plans
Our re-accreditation process has allowed us to pinpoint three areas that merit immediate improvement: the regular use of diagnostic tools to assess how we are faring with our stakeholders, the need for improved protocols for communication between stakeholders, and the development of a calendar that includes key dates to make sure that we are gathering and evaluating the data we need to improve as a school.
Notable Achievements and Areas of Improvement

Describe the school’s notable achievements and areas of improvement in the last three years. Additionally, describe areas for improvement that the school is striving to achieve in the next three years.

In 2012, MSMS was the only high school in Mississippi to earn recognition from Newsweek/The Daily Beast as one of the nation’s best high schools. Criteria for selection included four-year, on-time graduation rates, percent of 2011 graduates accepted to college, average SAT and/or ACT score, average AP/IB/AICE exam score, and AP/IB/AICE courses offered per student.

During the 2010-11 school year, MSMS was the subject of a technical brief published by the Stennis Institute of Government at Mississippi State University. The brief examined how taxpayer investment in MSMS and similar schools fosters economic development, especially in the high-tech sector. The brief notes that when MSMS students graduate, they enter fields that spur economic development at substantially higher rates than students from regular high schools. According to the school's most recent alumni survey, the overwhelming majority of our graduates have worked in Science, Technology, Engineering or Mathematical professions, and another 27.9% own or manage businesses, or work in a business-related field. Perhaps most impressively, only 2.8% were unemployed. Graduates like these make MSMS extremely attractive from an economic development standpoint; our alumni seek jobs--and sometimes even create jobs--in the high-tech enterprises that Mississippi covets most.

MSMS has facilitated numerous accomplishments by individual students. In the last three years, we have had 28 National Merit Semi-Finalists, which amounts to almost 10 percent of the number of students who have graduated in that span. We have sent students to the International Science Fair, and have had students publish and present their research at college and professional conferences. In 2011, two students presented their work at a regional conference for undergraduate scientists. One student has focused on the modernization and sensitization of a protein assay used to diagnose cystic fibrosis. The results of his work could improve cost-effective identification and treatment of cystic fibrosis patients from an earlier age. The financial and emotional benefits of his work are significant, as there are roughly 30,000 cystic fibrosis patients in the United States alone. He also presented results at the Mississippi Academy of Sciences meeting in February, as well as at the INTEL Science and Engineering Fair.

MSMS is busy nurturing the next generation of leaders in business and STEM disciplines. One young woman, a recent graduate from Fulton, completed research at Mississippi State University's Center for Advanced Vehicular Systems as part of a team that is designing a new style of bumpers for garbage trucks. "The new design should completely eliminate fatalities of drivers in smaller vehicles that might rear-end the trash truck," she said. "So, by the end of our research a new design will be published, tests for the durability of whatever material we decide to use should be finished, and hopefully the manufacturer will buy our design all while following the regulations of the Department of Transportation." This kind of research has obvious implications for a state that has worked so hard to attract investment from the automotive industry. It also represents an impressive marriage of engineering and business.

A recent graduate from Gautier was part of another team at Mississippi State. Its efforts focused on adding water vapor to a plasma environment and observing changes in the characteristics of the plasma. "Primarily, we noted a very large increase in the amount of hydroxyl," he said. "This chemical has the ability to kill bacteria, break down chemical warfare agents, and make combustion cleaner and more efficient." He is listed as one of the authors of the report on the experiments, which he intends to follow up with more work on improving the efficiency of combustion.

In addition to accomplishments in STEM fields, MSMS students have earned national recognition for their efforts as writers. Since 2010,
three students have placed in the Scholastic Art and Writing Awards competition, which draws up to 200,000 entries annually; 53 students earned recognition regionally. MSMS students also participate annually in the nationally recognized "Tales from the Crypt" even during the Columbus Pilgrimage.
Provide any additional information you would like to share with the public and community that were not prompted in the previous sections.

In 2008, the Quality Assurance Review Team made four recommendations.

1. Create and implement a plan for developing a state-wide understanding and appreciation for the unique value of the Mississippi School for Mathematics and Science.
2. Develop, implement, and fund a plan to attract and retain visionary leadership for the school.
3. Seek to stabilize adequate funding for the school from both public and private sources for the systemic and sustainable implementation of curricular and co-curricular programs that enable students to achieve the school's high expectations for learning.
4. Develop and implement a comprehensive professional development plan that is focused on achieving the school's continuous improvement plan for impacting student achievement outcomes.

Though MSMS developed a comprehensive and progressive continuous improvement plan, sustained and systematic steps were not taken to implement the plan and to respond appropriately to the recommendations. As has been stated previously and throughout the narrative in the report, changes in all key administrative positions have been made since the report was published. In addition, the transitions between the outgoing administrators and the incoming administrators were inadequate. Thus, all the momentum that was gained from the accreditation process was minimized. Some progress has been made towards meeting the goals and objections, but it has been ad hoc at best.

In the past two years, MSMS has been focused on moving forward and examining priorities, processes, and procedures. To address the recommendations, we have been focused on:

- Improving internal and external communication; this will help address recommendations 1 and 3 above.
- Engaging in continuous discussions about the MSMS mission and how we are meeting the goals and objectives for which we exist.

The Executive Director had all divisions to begin work on strategic plans for each of their divisions. In the process of discussing a strategic plan, the Director for Academic Affairs discovered that most of the goals and objectives of the 2008 Plan for Continuous Improvement submitted for the AdvancED Review are still relevant because they have not been addressed. Therefore, he has been working with the Academic Affairs Leadership Team (AALT) to examine and revise this plan.

To ensure that we do not neglect to focus on the continuous improvement plan, an MSMS Accountability Team will be formed after the 2013 review to continue the process. Faculty, staff, and administrators from all divisions will serve on the committee. In this way, all divisions will work together so the organization moves forward as one unit instead of separate divisions. A calendar is being developed with key dates for sending surveys, conducting meetings to review data, and evaluating progress within the continuous improvement plan.

Since we are a residential school, we have certain advantages over other schools, but we also have additional challenges. Because this review process focuses on traditional public schools, many of the standards and indicators do not adequately address MSMS. For instance, survey responses sometimes are lower because stakeholders have a negative view of the residence life component. With this said, we must do a better job at recruiting and providing professional development for our residence life staff. Their continued professional development is just as important, if not more, than that of faculty members. We are also aware that we need to improve the condition of the dorms.
of the expense and the fact that we must work with MUW officials, this will be difficult to achieve, but we must aggressively seek a resolution to this issue because we seek to provide a great overall experience for our students.