What Does Quality Programming Mean For High Achieving Students?

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Abstract

The Missouri Academy of Science, Mathematics and Computing (Missouri Academy) is a two-year accelerated, early-entrance-to-college, residential school that matches the level, complexity and pace of the curriculum with the readiness and motivation of high achieving high school students. The school is a part of Northwest Missouri State University and located on its campus in Maryville, Missouri. The school enrolls qualified high performing high school students (who have completed 10th grade from traditional high schools) into a curriculum consisting of college coursework taught by professors at the university. Missouri Academy students sit in the same classrooms with traditional university students, and professors have the same high expectations of them as they do for traditional university students. Students who complete this program receive a high school diploma and an Associate of Science degree.

The school has two primary goals: (i) to increase the pool of high school students adequately prepared to succeed in science, technology, engineering and mathematics (STEM), and (ii) to provide a sanctuary for the gifted, talented and high performing high school students. The Missouri Academy has made significant progress towards achieving its goals since its inception in August 2000. This success is in large part due to the way the school defines quality. The school defines quality in terms of; (i) a rigorous academic curriculum that is demanding, engaging and yet flexible; the curriculum is tilted towards science and mathematics, but contains key courses of study to develop (oral and written) communication skills and the humanities, (ii) high student expectations both in academic performance as well as personal character, and (iii) a residential life program that is age-appropriate, complements the academic program, and is designed to develop and nurture critical thinking skills.

This paper presents the philosophy, structure, organization and operation of the Missouri Academy, with the hope that this successful model may be replicated in other environments.

Introduction

The structure and design of public education in the USA tends to focus on the low-to-moderately performing students. While such efforts are noble in that they strive to ensure the success of all students, the unintended effect is to leave the gifted, talented and high performing students unchallenged. Colangelo et al[1], have characterized the American K-12 school system as keeping "bright students in line by forcing them to learn in a lock-step manner with their classmates". Cloud[2] gives specific examples of how this practice not only hurts specific students, but also the entire society. This phenomenon of neglect and isolation of the high performing students is not limited to the classroom milieu; Hebert and McBee[3] reported that this also takes place in all aspects of these adolescents' lives.

In response to this grinding mediocrity in the K-12 public school environment, the Missouri Academy was created with three distinctive qualities in mind. The first was to develop a program that matches the level, complexity, and pace of the curriculum with the readiness and motivation of gifted, talented and high performing students. The second quality was that the environment would be nurturing; a place where exceptionally high performing and/or gifted students can live and learn in a community of peers, while continuing to develop their critical thinking skills. The third quality was to take advantage of

[1]Colangelo, N, Assouline, S.G. and Gross, M.U.M. *A Nation Deceived: How Schools Hold Back America's Brightest Students,* Volume I. The Templeton National Report on Acceleration. Published at The University of Iowa, Iowa City, Iowa, 2004.
[2]Cloud, J. *Failing Our Geniuses: In US Schools, the highest achievers are too often challenged the least. Why that's hurting America – and how to fix it.* TIME, August 27, 2007. Page 41
[3]Hebert and McBee, Hebert, T.P. and McBee, M.T., *The Impact of an Undergraduate Honors Program on Gifted University Students.* Gifted Child Quarterly, Vol. 51, No. 2, (2007): 136-151.

the intellectual abilities of these students and their willingness to learn, by preparing them for success in science, technology, engineering and mathematics (STEM) fields. This third key quality arose from local and national reports[4,5,6] addressing imminent shortage of US college/university graduates in STEM fields.

The University Setting: Northwest Missouri State University (or simply, Northwest) is home to the Missouri Academy. Northwest is funded by the state of Missouri and accredited by the Higher Learning Commission (HLC) of the North Central Association of Colleges and Schools (NCA). It is a public four-year, regional, moderately selective, Masters II university (based on the Carnegie Classification[7]), and focuses on undergraduate education. The university offers 126 undergraduate majors, 35 master's programs, 3 specialist's degrees and a cooperative doctorate in Educational Leadership – in collaboration with the University of Missouri-Columbia. Other prominent features of Northwest Missouri State University include the following;

- National and state leader in Quality Systems
- Three-time winner of the prestigious Missouri Quality Award
- Finalist for the National Malcolm Baldridge Award (2004 and 2005)
- Christa McAuliffe National Award for Excellence in Teacher Education in 2006
- Nation's First Comprehensive "Electronic Campus" – Northwest was established in 1905 and the "Electronic Campus" started in 1987
- The total student population is 6,613, with 5,661 undergraduates and 952 graduate students
- There are 253 international students from 46 different nations
- The student/faculty ratio is 22:1
- An Honors Program is available to high performing undergraduate students

The focus on undergraduate education, small class sizes, strong liberal arts program, and strong tradition of emphasis on quality are characteristics that form an environment well suited for a school like the Missouri Academy. Thus, the Missouri Academy is an early-entrance-to-college (or accelerated) school that is set in a university environment and designed as follows:

- A cohort of high performing students, who have completed 10th grade from traditional high schools, is selected and brought to the live on the campus of Northwest Missouri State University. The school replaces a student's junior and senior years of traditional high school.
- While in residence on campus, the interplay between their academic studies and residential life is crucial to their overall success:
    - Academic studies: students are enrolled in a curriculum of university courses taught by university professors – these Missouri Academy students attend the same classes together with traditional university students, and professors have the same high expectations of them as they do for traditional university students. However, the Missouri Academy program is for two years, and upon successful completion, students receive a high school diploma and an Associates of Science degree.

[4]Missouri K-16 Coalition. *Report on Mathematics in Missouri.* October 26, 1999.
[5]The Glenn Commission. *Before It's Too Late: A Report to the Nation from The National Commission on Mathematics and Science Teaching for the 21st Century*. September 2000.
[6]Business Coalition for Education Reform. *The Formula for Success: A Business Leader's Guide for Supporting Math and Science Achievement*. May 1998.
[7]The Carnegie Classifications of Institutions of Higher Education. The Carnegie Foundation for the Advancement of Teaching (2005). www.carnegiefoundation.org/classifications/

  - Residential life: Missouri Academy students live in their own separate residential facility, with enhanced security and rules appropriate for adolescents 15-18 years of age. Programming of co-curricular and extra-curricular activities to complement their academic studies as well as their growth and development is important.
- Graduates of the Missouri Academy go on the complete baccalaureate degrees at Northwest Missouri State University, in-state institutions in Missouri and other institutions across the USA.

Since its inception in August 2000, the Missouri Academy has made significant progress towards success, by most measures. This paper presents a summary of the structure of the school and its success.

School Administration

The Missouri Academy was created in 2000, through an agreement among Northwest Missouri State University, the Missouri Coordinating Board for Higher Education (CBHE) and the Missouri Department of Elementary and Secondary Education (DESE). Approximately 90% of its financial support (i.e. staff salaries, operations and programs, building maintenance, etc.) comes from Northwest Missouri State University's budget, and 10% comes from DESE through the Average Daily Attendance (ADA) state funding formula for Missouri's K-12 school districts. Thus, the Missouri Academy is a school within a university structure, and as such, the principal administrator of the Missouri Academy is a dean, who reports to the Provost at Northwest Missouri State University. The professional staff of the Missouri Academy manages all aspects of the program except for providing in-class academic instruction – which is done by university professors.

Admission and Selection

Students typically apply for admission to the Missouri Academy during the 10th grade year at their traditional high schools. The Missouri Academy Admissions Committee, consisting Missouri Academy staff, uses the following criteria to select top candidates:

- Cumulative grade point average (GPA)[8] for 9th and 10th grades: a minimum of 3.5 is acceptable; the cumulative GPA is recalculated using only core subjects such as mathematics, science, history, geography, English/Language Arts, based on the official high school transcript.
- Standardized test scores: acceptable minimum ACT scores of 23 Composite and 24 Mathematics; equivalent SAT scores (minimum 1060 Total and 560 Mathematics) or PSAT scores (minimum Selection Index of 185 and 70 Mathematics) are also acceptable.
- Class Rank: students in the top 10% of their class.
- Teacher Evaluations: three evaluations from the mathematics, science and English teachers.
- Student Essay: a well-written essay describing the student's educational goals and ambitions.

In addition, all students are expected to have completed complete Algebra II and Geometry (in 9th and 10th grades) before enrolling at Missouri Academy. This ensures that all students have the minimum requisite skills for the first mathematics course at the Missouri Academy – Pre-Calculus.

Admission summary data for incoming first-year students are shown in Table 1. The average age of incoming students per cohort is 16.1. Based on mean ACT scores, mean high school GPA's, and other characteristics, the Missouri Academy enrolls talented/high achieving students, mostly with aspirations in

[8]Geiser, S. and Santelices, M.V. *Validity of High-School Grades in Predicting Student Success beyond the Freshman Year: High-School Record vs. Standardized Tests as Indicators of Four-Year College Outcomes.* Research & Occasional Paper Series: CSHE.6.07. University Of California, Berkeley. http://cshe.berkeley.edu/

STEM fields. In the past, the minority student population has been significantly lower than desirable (15%) based on Missouri's minority population; significant effort is underway to improve.

Academics

The Curriculum: The core curriculum presented in Table 2 is designed to provide high performing high school students with strong background in the basic sciences, mathematics, computer sciences through a selection of undergraduate courses that provide foundational knowledge in biological sciences (General Biology and Microbiology), chemical sciences (Chemistry I and II), physical sciences (calculus-based classical Physics I and II), computer sciences (Visual Basics and Computer Programming I) and mathematics (Pre-Calculus, Calculus I and Calculus II). Students have an opportunity to enroll in more advanced courses depending on their performance and abilities, as evidenced by placement tests, CLEP tests or other assessments determined by faculty in various academic departments. Two-thirds of the required credits hours in the Missouri Academy curriculum are generated from this Part 1. This Part 1 of the curriculum forms the basis for the Associate of Science degree in Science and Mathematics.

The second part (Part 2 in Table 2) of the curriculum provides students with background in communication and humanities. Communication competencies (written and oral) are extremely essential in the academe. Undergraduate courses in English composition and oral communication are intended to improve the students' communication competency skills. Courses in history, literature, political science and humanities enable students to be critical in their thinking about issues that confront them as citizens and as human beings; they add an understanding and appreciation of the experiences of others in different times, places, and cultures.

The third part (Part 3) of the curriculum involves general electives. These general electives are non-core additional undergraduate courses from other departments within university – they include music, foreign languages, economics, art, philosophy, wellness, etc. Most students tend to enroll in foreign languages and music.

One academic year consists of three terms: trimester-1 (August-December), trimester-2 (January-April), and May summer session. Students may enroll in 15-18 credits per trimester and 3-4 credits during the May summer session. Missouri Academy students are expected to complete this curriculum and graduate in two academic years, while maintaining a minimum cumulative GPA of 2.75. The Missouri Academy uses the following as primary indicators of individual and group academic progress: grades in coursework, general education competencies, post-admissions ACT scores, and performance of the Core Assessment in Science and Mathematics (CASM).

Grades in Coursework: Although maintaining a minimum GPA of 2.75 is required to remain enrolled at the Missouri Academy and to graduate, a minimum GPA of 3.0 is considered in good standing. In general, about 80-85% of the students remain in good standing throughout their two-year tenure. The common causes of attrition tend to be (a) dismissal for not maintaining the required academic standards and (b) voluntary withdrawal from the school for personal reasons.

General Education Competencies: Northwest Missouri State University requires all students (traditional university students and Missouri Academy students) with 42 or more credit hours to take a general education proficiency test. The university uses the well-developed instrument called the Measure of Academic Proficiency and Progress (MAPP).[9] MAPP measures the four general education skills critical thinking, reading, writing and mathematics. The instrument is used nationally and provides

[9]Educational Testing Services (2008). *MAPP – Measure of Academic Proficiency and Progress.* www.ets.org.

comparative data with other institutions that administered it. Table 4 compares the performance of Missouri Academy students against traditional university students at Northwest Missouri State University. On average, about 94% of Missouri Academy students score at or above the 67th percentile. This performance is significantly above the national average of 50%, and also above that of the traditional university students at Northwest Missouri State University.

Post-Admissions ACT: To be considered for admission to the Missouri Academy, all students are expected to take the ACT test and submit their scores. These scores are referred to as Pre-Admission ACT scores. A year after students are enrolled at the Missouri Academy, they re-take the ACT test to improve their scores. These are referred to as Post-Admission ACT scores. Table 5 shows that Missouri Academy students generally gain 2-3 points on their ACT scores over a two-year period. Using the college readiness benchmarks developed by ACT, these students not only out-perform their Missouri peers (see Table 5), they also out-perform their peers at similar academies in the USA (data not shown).[10]

Core Assessment in Science and Mathematics: The Missouri Academy staff and university faculty in biology, chemistry, physics, mathematics and computer science departments, developed the Core Assessment of Science and Mathematics (CASM), designed as a pre- and post-test measure or outcome assessment for fundamental and enduring knowledge in these subjects based on the curriculum.[11] All new students enrolling at the Missouri Academy for the first time take the CASM test one week before classes begin in the Fall trimester (Pre-test CASM). The cohort then takes the same test again (two years later) just prior to graduation (Post-test CASM). Table 6 shows the difference between student performances on the pre-CASM versus the post-CASM for all students who have graduated from the Missouri Academy. The table shows cohort means. The differences are statistically significant ($p<0.05$) for performance in all courses. Thus, gains in these disciplines represent value added.

Residential Life

Residential Building: Cooper Hall and Douglas Hall are two adjoining buildings located in the middle of the campus at Northwest Missouri State University. These two buildings make up what is referred to as North Complex – home of the Missouri Academy. The administrative offices are located on first floor of Cooper Hall, and student and Residential Counselor (RC) residence on 2nd, 3rd and 4th floors of Cooper Hall and 1st, 2nd and 3rd floors of Douglas Hall. An RC (a Missouri Academy staff member) is an adult who lives in an apartment on the same floor with Missouri Academy students in North Complex. RC's are full-time administrative professionals who are responsible for the well-being of Missouri Academy students while in residence. Their qualifications include at least a baccalaureate degree in any field and prior experience in residential life or closely working with adolescents. Each RC is responsible for about 25 students.

Residential Programming: Services provided to students are predicated on a model of student development[12,13]. Within this model, programs and activities fall within the following structure:

a. Educational Programming: this is designed to help students learn outside of the classroom, to promote social/cultural competence, health/wellness, intellect, and citizenship and to help

[10]Allen, J. and Sconing, J. *Using ACT Assessment Scores to Set Benchmarks for College Readiness.* ACT Research Report Series 2005-3.

[11]Theodore, R. and Pinizzotto, R.(2006). *Documenting student achievement in science, mathematics and computing: An outcome-based assessment.* NCSSSMST Journal, 11, 2, 16-19.

[12]Chickering, A. W. and Reisser, L. 1927- Education and identity (Second Edition). San Francisco: Jossey-Bass Publishers, c1993.

[13]Carnegie Foundation for the Advancement of Teaching. Campus life: in search of community. Published by Princeton, N.J.: The Foundation, c1990.

students become independent/critical thinkers and productive members of the community. Four areas of emphases include:

- Social/inter-cultural competence – promotes social and cultural awareness, acceptance, and broadens horizons.
- Health and wellness – promotes emotional wellness (awareness and acceptance of one's self/image) and physical wellness (awareness of self-care, health, good diet, fitness).
- Intellectual – stimulates mental activities, encourages creativity, and develops a sense of personal values, ethics, and rationale. Character education[14,15] in an academic setting is crucial for well-balanced student development.
- Citizenship – explores personal responsibility and encourages students to contribute to their community in meaningful ways. Community service is an important dimension of citizenship at the Missouri Academy.

b. Social Programming – is designed to create a sense of community within the living/learning community of the Missouri Academy by promoting companionship, compatibility, and sociability among the students. To help students build meaningful and interdependent relationships.

RC's are expected to help build community on their floor, as well as within the entire Missouri Academy community. Students are given ample opportunity to engage in social activities with each other and find their place in the community. Some activities to foster this sense of community include dances, video game parties, bowling, intramural sports, and trips to the zoo, opera or canoeing. In addition, students have opportunities to participate in engineering competitions, mathematics league competitions, robotics competitions, Future Business Leaders of America (FBLA), Model United Nations, Science Olympiad and regional or national conferences to present results of their research.

Seminar and Colloquium: First-year Missouri Academy students are required to participate in a one-credit hour, year-long Academy Seminar course. This seminar course is a useful forum and avenue for engaging first-year students about elements of success[16] in a college/university environment, as well as community building at the Missouri Academy and Northwest Missouri State University at large. Topics covered in this class include study habits, time management, wellness, interpersonal relationships, note-taking, ethics, writing, substance abuse, independent living, etc. Second-year students are required to enroll in a year-long, one-credit hour Academy Colloquium course. The course content is developed around the following four conceptual areas:

- Exploring connections between academic majors and professions/careers,
- Community service experiences, and
- Leadership, social responsibility and citizenship.

The Missouri Academy staff facilitates both the Academy Seminar and the Academy Colloquium. These are the only two courses in which Missouri Academy students are enrolled that are not taught by professors at Northwest Missouri State University.

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[14]Novick, B., Kress, J.S., and Elias, M.J. *Building Learning Communities with Character: How to Integrate Academic, Social, and Emotional Learning.* Copyright © 2002 by Association for Supervision and Curriculum Development.

[15]Brooks, B.D. and Mark E. Kann, M.E. *What Makes Character Education Programs Work? Eleven elements are essential if character education programs are to improve student conduct and enrich the educational environment.* Character Education: Vol. 51, Number 3. November 1993. Page 19-21.

[16]Gardner, J.J., A.J. Jewler, and Barefoot, B., *Your College Experience: Strategies for Success*, 7th Edition. Belmont, California: Wadsworth Publishing Company, 2006.

Missouri Academy Graduates

Where Missouri Academy Graduates Matriculate: 100% of Missouri Academy graduates go on to pursue four-year baccalaureate degrees, with about 67% are matriculating at Missouri institutions. Most graduates tend to transfer and complete their baccalaureate degrees at institutions like Boston University, Cornell University, Colorado School of Mines, Duke University, MIT, Illinois Institute of Technology, University of Missouri-Columbia, Missouri University of Science and Technology, UC-Berkeley, Truman State University, University of Pennsylvania, Saint Louis University, University of Oklahoma, Washington University, etc. A few (5-10% of graduates) remain at Northwest Missouri State University to complete their baccalaureate degrees.

What We Learn From Graduates: Each graduating cohort is surveyed one year after graduation, and the response rate is between 60% and 70%. The following observations can be made about graduates based on these surveys:

- 80% are pursue baccalaureate degrees in science, mathematics, engineering, or technology fields
- They are academically successful – they maintain an average GPA of 3.48 one year after graduating from the Missouri Academy
- Greater than 93% acknowledge that their academic preparation at Northwest Missouri State University was strong/rigorous
- 92% say Northwest Missouri State University professors are as good or better (in teaching) as professors where the students attend college/university one year later
- 86% of the graduates responding to this survey reported that they are college juniors or seniors one-year after graduating from the Missouri Academy

Survey data from these graduates consistently indicates that more than 92% are satisfied with their overall experience at the Missouri Academy. Therefore, the overall quality of education at Northwest Missouri State University is challenging, rewarding and engaging for these high performing students.

Conclusions

Both qualitative and quantitative results from the Missouri Academy strongly suggest that this is one successful model for quality programming for high achieving students. The model consists of two equally important components: (i) a challenging curriculum that is rigorous, flexible, and with a sense of direction (e.g. STEM-tilted), and (ii) a residential component that is age-appropriate, and complements and supports the academic program. The following general observations and conclusions can now be made about lessons learned from eight years of existence of the Missouri Academy:

- Albeit in a small way, the Missouri Academy serves to reverse the larger societal problem/trend of the declining[17,18] number of US youth (ages 16-18) choosing to specialize in STEM programs. Surveys indicate that many of these students would not have chosen to pursue baccalaureate degrees in STEM fields if they had not attended the Missouri Academy. In addition, many of these students choose to stay in Missouri for completion of baccalaureate degrees, employment after baccalaureate degrees, and for graduate work (data not shown). This further suggests that the state's investment is paying off.

[17]Walters, A.K. *Business Leaders Seek to Double College Graduates in Science, Technology, Engineering, and Mathematics.* The Chronicle of Higher Education. July 28, 2005.

[18]Business Week Online. *Special Report: America's Tech Might: Slipping? America's Failure in Science Education: The shortage of science and technology grads threatens the U.S. economy, and Washington's help is badly needed to tackle the problem.* March 16, 2004.

- Missouri Academy students, like traditional university students at Northwest Missouri State University, receive high quality undergraduate education in science, mathematics, and computing at Northwest Missouri State University. The Missouri Academy graduates' continued success at various higher education institutions are strong indicators.
- Missouri Academy students are successful both academically and developmentally in large part because of (a) a high quality curriculum, (b) a rich residential life program that is supportive and complements the academics. This lends the school as an appropriate model for changes in some K-12 traditional educational environments. Thus, educational acceleration[19,20] for these students appears to be successful. The Missouri Academy has already served as a model for the creation of science and mathematics academies in Kentucky and Kansas.
- The Missouri Academy represents a successful collaboration between a public four-year university, a state agency for high education (in this case the Missouri Coordinating Board for Higher Education), and a state department of education (in this case the Missouri Department of Elementary and Secondary Education), in furthering the goals of the state.

Tables

Table 1. Historical admissions data for the Missouri Academy

	Enrolled Students	Mean ACT		Mean GPA: (9^{th}-10^{th} grades)	Mean Class Rank (top x%)	Female / Male	Minorities (%)*
		Composite	Math				
Class of 2002	41	27.2 ± 3.1	26.3 ± 3.2	3.8 ± 0.3	9.0%	23 / 18	3 (7.3%)
Class of 2003	57	27.8 ± 2.5	28.1 ± 2.8	3.9 ± 0.2	6.4%	30 / 27	9 (15.8%)
Class of 2004	58	28.3 ± 1.9	28.0 ± 2.2	3.9 ± 0.2	7.1%	28 / 30	9 (15.5%)
Class of 2005	44	27.5 ± 2.8	27.1 ± 3.2	3.8 ± 0.2	6.7%	23 / 21	9 (20.5%)
Class of 2006	54	26.7 ± 2.4	27.8 ± 2.7	3.8 ± 0.3	7.3%	32 / 22	6 (11.1%)
Class of 2007	59	26.2 ± 2.7	27.1 ± 2.6	3.9 ± 0.2	5.4%	26 / 33	4 (6.8%)
Class of 2008	54	26.8 ± 2.8	27.8± 2.4	3.8 ± 0.3	9.0%	24 / 30	5 (9.3%)
Class of 2009	88 (12)**	26.2 ± 2.3	26.6 ± 2.9	3.9 ± 0.2	6.3%	43 / 33	8 (9.1%)
Class of 2010	103 (10)**	26.0 ± 1.8	26.2 ± 1.9	3.9 ± 0.1	9.8%	49 / 54	17 (16.3%)

*The term "minorities" in this table refers only to U.S. citizens and permanent residents who are of African descent (blacks), of Asian descent, of Latin American descent and Native Americans. International students are not counted as "minorities".

**The number of international students is in parentheses. International students' admissions academic data are not included in the ACT, GPA and Class Rank calculations in the table above.

Table 2. Missouri Academy core curriculum

	Disciplines	Course	Credits
PART 1 (Core requirements)	**Science:**		
	• Biological/Life Sciences	General Biology	4
		General Microbiology	4
	• Chemical Sciences	Chemistry I	4
		Chemistry II	5
	• Physical Sciences	Physics I	5
		Physics II	5
	Mathematics	Pre-Calculus	4
		Calculus I	4

[19]Kulik, J. A., and Kulik, C. L. C. *The effects of accelerated instruction on students.* Review of Educational Research, 54(3), 409–425. 1984.

[20]Ma, X., *Does early acceleration of advanced students in mathematics pay off? An examination of mathematics participation in the senior grades.* Focus on Learning Problems in Mathematics, 22(1), 68–79. 2000.

		Calculus II	4
	Computer Sciences	Introduction to Computer Programming using Visual Basic Computer Programming I	3 3
PART 2 (Core requirements)	**English/Communication:**	Composition I Composition II Literature Fundamentals of Oral Communication	3 3 3 3
	Social Science & Humanities: History Political Science Humanities	American History (America - A Historical Survey) Introduction to American Government and Politics Humanities elective (approved by Advisor)	3 3 3
	Seminar/Colloquium:	Seminar (for first-year students) Colloquium (for second-year students)	1 1
		Credits Required for Graduation	**68**
PART 3 (General electives)	Students may select general electives from courses offered within the university they may select general electives in music, foreign languages, economics, art, wellness, etc. (see Section 12 below)		**6 - 12**

Table 3. GPA data performance for Missouri Academy students

	Average Cumulative GPA				Number graduated versus initially enrolled	% Retention**
	Students with GPA < 2.75	Students with GPA 2.75 – 2.99	Students with GPA 3.0 – 3.5	Students with GPA > 3.5		
Class of 2002	0	8	11	11	30 / 41	73%
Class of 2003	0	7	9	22	38 / 58	67%
Class of 2004	0	7	20	23	50 / 58	86%
Class of 2005	0	9	8	17	34 / 44	77%
Class of 2006	0	5	27	15	47 / 54	87%
Class of 2007	0	8	15	14	37 / 58	64%
Class of 2008	2	8	15	16	35 / 54	65%
Class of 2009*	6	9	30	36	81 / 88	-

*Completed their first academic year and will be returning for the second year in 2008-2009.

**Retention here is defined as the number of students graduating per cohort versus the number of students who originally enrolled in that cohort.

Table 4. MAPP data performance for Missouri Academy students

	Percent of students scoring at <67th percentile		Percent of students scoring at ≥ 67th and <90th percentile range		Percent of students scoring at ≥ 90th percentile	
Class ID	Northwest	MASMC*	Northwest	MASMC	Northwest	MASMC
Class of 2002	67.5%	3.4%	22.1%	33.3%	10.4%	63.3%
Class of 2003	59.2%	11.4%	27.8%	17.1%	13.0%	71.5%
Class of 2004	58.1%	6.0%	27.8%	24.0%	14.2%	70.0%
Class of 2005	55.9%	5.7%	29.8%	17.1%	14.3%	77.2%
Class of 2006	53.7%	4.3%	34.3%	25.5%	12.0%	70.2%
Class of 2007	60.3%	7.5%	28.5%	25.0%	11.1%	67.5%
Class of 2008	58.2%	0.0%	29.5%	22.9%	12.3%	77.1%

*MASMC stands for Missouri Academy of Science, Mathematics and Computing.

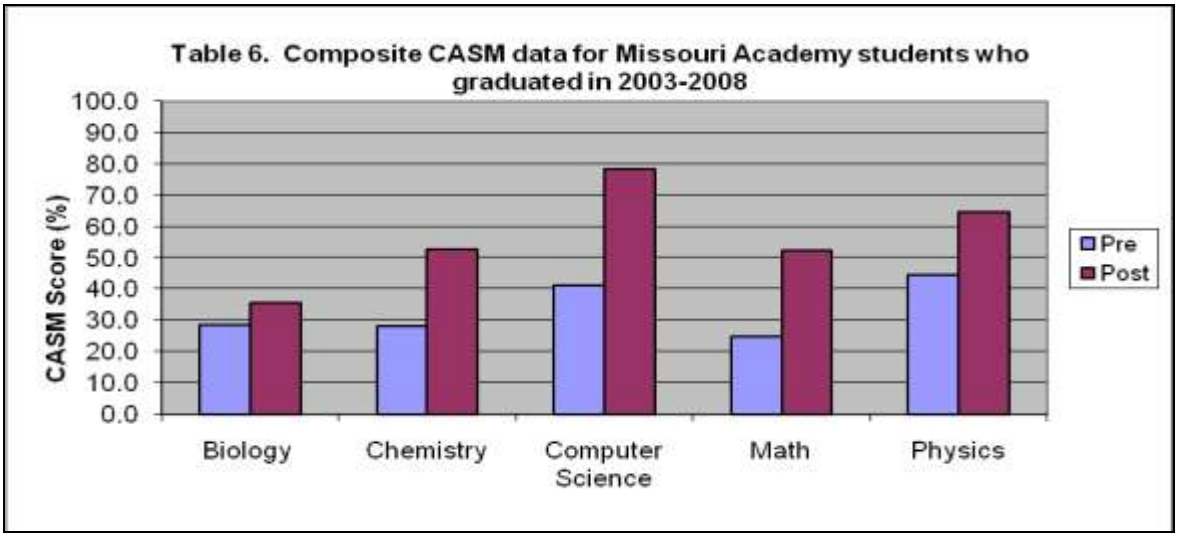
Table 5. ACT data performance for Missouri Academy students

Class of	*Pre- and Post-Admissions ACT: composite scores (means)		Percent of Students Meeting College Readiness Benchmarks**									
			Meeting All		English		Mathematics		Reading		Science	
	Pre	Post	MASMC***	MO	MASMC	MO	MASMC	MO	MASMC	MO	MASMC	MO
2003	27.8	30.4	97	23	100	72	100	40	100	56	97	29
2004	28.3	30.5	100	23	100	74	100	42	100	56	100	30
2005	27.5	30.6	96	23	100	74	100	42	100	56	96	30
2006	26.7	29.7	97	24	100	74	100	43	100	57	97	30
2007	26.2	30.4	88	25	97	74	97	42	94	56	91	31
2008	26.8	30.1	94	24	100	73	100	42	100	57	94	31

*Pre-Admissions ACT test scores are mean composite ACT scores for the cohorts at the time of initial enrollment at the Missouri Academy; the Post-Admissions ACT scores refer to cohort mean composite ACT scores for the ACT test taken one year after enrollment at the Missouri Academy.

**College readiness benchmarks are based on ACT testing.

***MASMC stands for Missouri Academy of Science, Mathematics and Computing; and MO stands for Missouri



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2. Cloud, J. *Failing Our Geniuses: In US Schools, the highest achievers are too often challenged the least. Why that's hurting America – and how to fix it.* TIME, August 27, 2007. Page 41
3. Hebert and McBee, Hebert, T.P. and McBee, M.T., *The Impact of an Undergraduate Honors Program on Gifted University Students.* Gifted Child Quarterly, Vol. 51, No. 2, (2007): 136-151.
4. Missouri K-16 Coalition. *Report on Mathematics in Missouri.* October 26, 1999.
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