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The Message 2.0: Perceptions of Success from Members of the Founding Class of MC Squared STEM High School

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THE MESSAGE 2.0: PERCEPTIONS OF SUCCESS FROM MEMBERS OF THE

FOUNDING CLASS OF MC SQUARED STEM HIGH SCHOOL

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Dissertation

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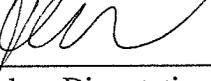
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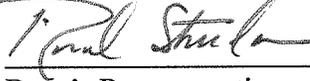
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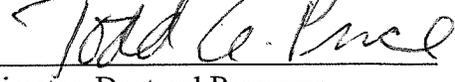
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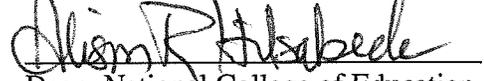
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ABSTRACT

This dissertation examines the methods of learning from the student's perspective in order to understand what made the first graduating class of MC Squared successful. The conceptual model of student success composed of non-academic factors of motivation, social connectedness, and self-management was used for the lens from which to understand the six students in depth. Through the research, it was uncovered that diversified learning environments, a mastery based assessment system, and an unwavering acceptance of students within a challenging and supportive environment are essential to the success achieved at MC Squared STEM High School. Lastly, the seminal contribution of this work is the Student Success Triangle (realignment of the primary non-academic factors).

ACKNOWLEDGEMENTS

it meant to teach and lead. I often refer to what they taught me when making decisions today.

When I decided to make the transition to Cleveland, Eric Gordon was there to fill the void that leaving Virgil, Larry, and Karol had created. Even though Eric was responsible for leading the academic development of the district's 100 schools, he always had time to talk to me and work with me. He elevated my thinking to a new level and showed me that servant leadership did not have to change just because the numbers of people that you serve increases significantly.

Santo Nicotera coached me in Lima and has continued to work with me since I have moved to Cleveland. His experience and wisdom have helped me to understand who I am as an educator and a person.

Dr. Gina Weisblat has been my local mentor and thought partner through this entire project. Gina is a brilliant thinker that has graciously spent time pushing my thinking, keeping me organized, and keeping me on a schedule. I am not sure that I believed that I could actually get this completed until she started to work with me.

Finally Dr. Norman Weston was able to get me through this process. He has always made time for me. He has taught me how to express my thinking and formulate my research. He has modeled academic scholarship and discipline for me.

DEDICATION

This dissertation is dedicated to the students of MC Squared STEM High School. Your passion and commitment in the face of extreme obstacles continues to inspire me. You have profoundly impacted my ability to understand and I will continue to work to find the best methods by which to unleash your limitless potential and the limitless potential of your peers. I have heard your message.

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It's like a jungle sometimes it makes me wonder how I keep from going under.

-Grandmaster Flash

CHAPTER 1: INTRODUCTION

The Call

When my cell phone started ringing that night in the winter of 2008 I almost

didn't answer. I was relaxing in my favorite chair and watching NBA basketball. I

looked at my phone, saw an area code that I did not recognize, reluctantly reached down,

picked up my phone, and answered like I always did when I did not know who was

calling. "Jeff McClellan," I said in an almost irritated tone.

"Hello Jeff, my name is Jane and I am calling you on behalf of the Cleveland

Metropolitan School District to see if you might be interested in finding out more about

the STEM school that the district is planning to open next fall".

As the conversation continued, I straightened up in my chair. A number of

thoughts raced through my head. "How did this woman get my name?" "How could I

possibly leave my school here in Lima?" "What is my wife going to think?" "I didn't

know that schools hired head hunters to recruit principals." "What does STEM stand

for?" "That was a foul!!" The conversation lasted just a few minutes and I managed to

tune out the thoughts in my head and the basketball game long enough to comprehend

that the school was going to be one of the first of its kind in the region and that it was part

of the Cleveland Metropolitan School District. While I was not considering leaving Lima

Senior before the initial phone call, this opportunity was very intriguing. A year-round

school, housed within industry partners, with a project-based approach to the delivery of

a college-preparatory science, technology, engineering, and math (STEM) based

education. Jane promised to email me information about the school and send a DVD of

the Chief Academic Officer describing the school. I hung up the phone, turned off the TV and went upstairs to tell my wife what had just happened.

After the phone call, I found myself at a cross-road. I enjoyed The School of Multiple Intelligences in Lima but how could I pass up the opportunity to apply what I had learned through the work in Lima to build the ideal small high school from the ground up? I saw the opportunity in Cleveland as an opportunity to create the type of school that students of the 21st century needed. When I received that call in 2008 I had been in the education profession for almost 10 years. What follows is the story of how I got to that point on my journey.

<div align="center">The Journey Begins: Who am I that Teaches?</div>

My educational career began with a student teaching experience at Lima Senior High School (LSH) in the fall of 1998.   I was assigned to a teacher of thirty years. This teacher showed me how to teach. The classroom was orderly, all students were treated equally, and kids took tests. His students were programmed to enter the classroom obediently and sit passively as he delivered information through a combination of practices including work sheets, lecture notes, and videos. The teacher had regular assessments on which students were expected to show their recall of facts by filling in rectangles on a bubble sheet and sometimes locating vocabulary words in word searches. With the exception of the use of VCR tapes, his classroom probably had not changed much since he began teaching in the mid-sixties. While he was covering the material that he was supposed to be covering, the class was lifeless and many of the students who were coming to class were failing miserably (many others were choosing not to come at all); but it was fine with the teacher because he was teaching the class and he could not do

anything if the students did not want to learn. I struggled with this concept at times because it seemed that when I was able to engage the class more in dialogue and listen to the students they were more willing to take risks and participate. Probably because of my own maturity level and definitely because of my lack of experience and self-confidence, I did not spend that much time thinking about why some of my lessons and interactions with the students elicited more positive responses from the students.

LSH offered me a full time job in January. The students in the classes that I taught had been tracked into my class because they were not expected to go to college, they were not expected to be on the honor roll, and they were not expected by most to even graduate from high school. The position was available because the students had forced their previous teacher out of the profession midyear. I was eager to have my own classroom and welcomed the opportunity. At the beginning, the situation got the best of me. My room was right next to the teacher who had worked with me during my student teaching experience and he did everything that he could to help me. I was confused and lost. I was trying everything: incentives for being in class on time, calling parents of disruptive students every night, giving more notes, more worksheets, and more tests. I was frustrated because it seemed to me that I was doing everything that I could and that the students were just not capable of success. I often found support in the teachers' lounge where other more seasoned teachers sat and complained about some of the same kids. These teachers would console me with comments about how so-and-so was never going to change and that the teacher had had his mother in school and she was the same way. It seemed like a hopeless situation. The kids were failures.

The more I worked that first year, the more conflicted I became. Just when I was ready to shirk all responsibility and buy in to the notion that none of this was my fault a student would do something that would really set my thinking back. Just when I was ready to write off another hopeless situation I would catch a glimmer of hope.

These glimmers rarely ever happened during actual class time. I was always at school early and I had begun to coach sophomore basketball so I was always there late. Kids started to pick up on this and pretty soon some of the biggest failures in class were hanging out in my room before or after school. They would come in and hang out. Sometimes it was to talk to me, other times just to listen to their head phones. After a while, I was able to talk to them. They were much more insightful and observant than any of my lunch colleagues had given them credit for. Pretty soon I was even able to get them to do some of the work that they had refused to do in class. Initially I was dumfounded by the fact that some of the same students who would blatantly defy me in class would come to my room after school and talk openly with me. As I began to get to know my students, I began to listen to why they did not like my class and the school. I began to see potential. I was beginning to determine that my heart was the source of good teaching (Palmer 1998)

I began to feel uncomfortable eating in the staff lounge with my cooperating teachers who had "showed me the ropes" because none of them seemed to feel responsible for the fact that over half of the students were not graduating from high school. At the same time, I noticed that those teachers that were advising me at lunch were not there in the morning or after school, but other teachers were. These other teachers seemed much happier than my initial lunch crew and seemed to be having much

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more success with the same students that were driving me crazy. I noticed that some of those teachers had the same lunch period that I did but were never in the staff lunch room. They had their own lunch club which met in one of their classrooms and often included students. One evening I was talking to one of the teachers and he invited me to join them for lunch. I joined them the next day. These teachers did not sit around and complain. They shared their experiences with each other, they talked about things that they had tried that had not worked, and they shared suggestions for the next time. They compared stories about what students had done in their classes like fishermen compare stories about the size of the fish they caught.

My 9th period class was causing me extraordinary stress. I was still failing to reach them and we were both failing miserably. One day my patience had run out, and I put away my lesson plan and began to talk to the students about education. Specifically I asked the students why they did not care about science. Their answers made it clear to me that they did not see how any of my "stuff" mattered to them. The students knew that many people in the school and in their personal lives had already written them off and they were not willing to play the game of school. So we talked. The conversation carried over several days' worth of class and the time between conversations gave me the opportunity to reflect upon what was being said and what was not being said. I spoke to my new colleagues and they suggested that I try something different with the class. After further discussion with the class it was decided that we would construct a freshwater fish ecosystem in the front of the room. Ninth period researched and established a tropical freshwater ecosystem equipped with snails, algae eating fish, live plants, and an Oscar fish.

The results were amazing. Students were interested in biology. Not because I stood in front of them and told them it was important, not because I threatened to call their parents if they did not turn in their homework, and definitely not because I kept telling them that if they did not complete the assignments that they would fail. They were already used to that. I had learned a powerful lesson, education and learning were no longer about what I was teaching but about how I was teaching. This new method engaged the students and they engaged me. I began to ask myself, as Parker Palmer (1998) puts it, how should I be teaching? And I began to realize that I possessed the power to create conditions that could help students learn a great deal –- or to keep them from learning at all (p. 6)

The next four years were very enjoyable. Of course I had moments in the classroom that made me question my choice to be a teacher, but for the most part I was very satisfied with the experience of teaching. While the teaching experiences in my classroom were thoroughly enjoyable, I was getting very frustrated with the bureaucracy of the high school and district. Jim Collins (2001) sums up what I was feeling:

> Bureaucratic cultures arise to compensate for incompetence and lack of discipline, which arises from having the wrong people on the bus in the first place. If you get the right people on and the wrong people off, you don't need stultifying bureaucracy. (p. 142)

At this time in my career, I had a decision to make. I was either going to help make the school better, or I was going to leave the district in search of a school that supported my developing beliefs about education. I was approached by the principal who seemed to sense my frustration and asked to become a building coach. I viewed this as a

sign, an invitation to become part of the solution. I was enthused by the opportunity to lead, but soon became frustrated again by how systemic some of the problems were. I was hired to work with teachers on their practice but much of the work seemed fruitless because the system seemed to contradict the efforts of people who tried to do things differently.

I was not the only one who felt this way about the school. There was a dedicated group of individuals comprised of several district-level employees, teachers, board members, and community members. We were sent to KnowledgeWorks meetings and began to learn about the Small Schools Concept. The Small Schools Concept seemed to fit the needs of our failing school. We bought into the concept and began to work hard to ensure that LSH was awarded a Small Schools Transformation Grant. Through the transformation process, I was introduced to the Coalition of Essential Schools and immediately bought into the ten common principles.

> Learning to use one's mind well; Less is more, depth over coverage;
> Goals apply to all students; Personalization; Student-as-worker, teacher-
> as-coach; Demonstration of mastery; A tone of decency and trust;
> Commitment to the entire school; Resources dedicated to teaching and
> learning; Democracy and equity
>
> (http://www.essentialschools.org/items/4)

I Accept a Formal Leadership Position

This work forced me to ask myself: Why we were doing things the way we were doing them?

After a difficult year of conversations with the community and staff, the district was prepared to move forward with the Small Schools Concept. Even though I did not hold a valid administrators certificate or even a Master's Degree, I was encouraged to apply for the newly developed position of Small School Leader.

My first task as Small School Leader was to convene a design team from existing staff, students, and community of Lima Senior High School and create our small school. Our design team worked through the fall and winter to design our school. We examined every aspect of our school in order to provide for a more humane learning environment and allow our students' educational experience to be a rich, supportive, and engaging experience. We were asking the why questions. As a result of our work, we developed The School of Multiple Intelligences. Our school would deliver instruction and assess students in ways that were consistent with the intelligences described by Howard Gardner (1999)

I would not say I was exactly a reluctant leader because I looked forward to the challenges of establishing a new culture with a staff that had been part of the toxic culture of the old LSH, but I was definitely an inexperienced leader.

My first summer I spent countless hours trying to schedule students into the trimester block schedule that my school had selected as the best to support the implementation of our new instructional approach. The scheduling was not the biggest problem. I had to deal with staff members who did not buy into the concept and had

stayed around in order to keep their jobs. These staff members were hoping to ride this educational reform wave out much like they had the countless other initiatives that had been started and stopped during their careers. But this one was different because it reached to the very core of how the school would educate and therefore required a paradigm shift that would change the course of the students of Lima Senior High School forever.

By the end of the first year people were beginning to trust each other and our school had really begun to function well. We worked very hard on relationship building within all levels of the system and we were seeing results. We committed to ensuring that all students were intellectually challenged and we also focused on ensuring that every student in our school was being held accountable for academic success. Our tenth graders had out performed both groups of tenth graders in the other schools in the building and we were selected by the KnowledgeWorks Foundation to speak on behalf of High School Transformation to the California Teachers Association in July at UCLA.

The second and third years were each better than the prior year, as the school continued to develop a sense of common purpose, which then evolved into common actions. We saw growth in our test scores during each year and witnessed the power of collaboration as all areas of our school improved. The experience was not only a school transformation but also part of a personal transformation. It helped show me what I have been put on Earth to do. The work was relentless, but I enjoyed every second of it. From the challenges of working with parents who had grown not to trust schools in general, to the difficult work of bringing a high school out of academic emergency, I had, to paraphrase Palmer, begun to discover who the self is that teaches. So, just as I was truly

discovering who I was as an educator, I was being called to move to Cleveland and open this new school.

MC Squared was designed to not only educate its own students in a very innovative way but it was also tasked with informing and driving the advancement of curricula and instructional programming at other schools in Ohio and across the country. Even though I was strongly committed to Lima Senior High School of Multiple Intelligences when I had begun to discover who I was, I could not pass up the opportunity to bring this vision to reality in Cleveland, Ohio

<div align="center">The MC Squared Opportunity</div>

In the fall of 2008 the Cleveland Metropolitan School District and the Metropolitan Cleveland Consortium for Science Technology Engineering and Mathematics (STEM), whose 80-plus members include NASA Glenn Research Center, Cleveland Clinic, University Circle Institutions, General Electric, Eaton, Seimens, Case-Western Reserve University, Cleveland State University, Kent State University and Cuyahoga Community College, opened the doors of the first HB 119 STEM high school in the state of Ohio.

The Metropolitan Cleveland Consortium (MC Squared) STEM High School was designed for the 21st century. By design MC Squared opened its enrollment to the 124,000 students across 18 public school districts; it is a year round school and mobile campus structure that uses corporate sites and downtown Cleveland as its classroom with a uniquely designed governance structure. MC Squared positioned itself to become a national model for STEM education.

Central to the school's vision are its seven core design principles. These design principles, crafted by the MC Squared STEM Hub, serve to provide the backbone for every aspect of the school's design and have been closely aligned to the design principles offered by the Partnership for Continued Learning and the Ohio STEM Learning Network. These core design principles are:

1. MC Squared STEM High School will ensure opportunities for all students to be academically challenged while appropriately supported. There will be no academic admission criteria, and all students who have passed eighth grade are eligible to enroll.

2. MC Squared STEM High School will use multiple metrics to measure success. Students will be expected to demonstrate mastery of the curriculum in multiple ways and no one single measure of achievement alone will be considered an appropriate demonstration of mastery.

3. MC Squared STEM High School's instructional program will reflect the need for all STEM work to be trans-disciplinary in nature. Students will be expected to master the core literacy skills of writing, reading, speaking, listening, viewing, and presenting and the STEM literacy skills of design, inquiry, invention, and teamwork through highly differentiated instructional programming.

4. MC Squared STEM High School's instructional program will be highly differentiated, ensuring a culture of discovery, collaborative learning, content integration, and workforce relevance using a problem-based learning approach.

5. MC Squared STEM High School will hire a diverse faculty composed of industry partners, instructors from institutions of higher education and the skilled-trades, and

PreK-12 education instructors, and will ensure regular professional development focused on cross-training experiences thorough development of trans-disciplinary instructional units and systemic strategies for knowledge-sharing amongst the STEM disciplines.

6. MC Squared will serve as a microcosm of the global STEM community. All STEM school partners, including students, parents, faculty and staff, and community participants, will be engaged in an array of opportunities to work collaboratively in leadership roles, internship/fellowships, advisories, mentorships, and service learning roles.

7. MC Squared will recognize the importance of citizenship and will ensure ongoing outreach opportunities that promote the strengths of the school community and ensure parents are actively engaged in their child's education in relevant and meaningful ways.

Once I accepted the opportunity as the founding head of MC Squared in June of 2008, my first task was to bring the vision of the school into reality. Working with the partners that had been instrumental in developing the vision, we began to move the school model from idea to reality. Our work between June 2008 and August 2008 resulted in the following design features for MC Squared.

Design Features Built from Design Principles

MC Squared STEM High School is based on Ohio House Bill 119 and is part of the Ohio STEM Learning Network (OSLN) and has the following innovative features:

- 75% of seats reserved for Cleveland Metropolitan School District students
- 25% of seats available to students within Cleveland-area communities

- Multi-campus high school with:

  - 9th grade located at the Great Lakes Science Center with NASA as a community partner

  - 10th grade located at Nela Park (GE's world headquarters for Lighting) and partnered with GE Lighting

  - 11th and 12th grade located near Cleveland State University with students attending college courses on college campuses, participating in paid internships, and taking classes at school location in downtown Cleveland, Ohio.

- Trans-Disciplinary Project-based school focused on issues of energy and sustainability

- Year round school – 10 weeks on and 3 weeks off

- Admission by application and lottery, no enrollment criteria

- Credit based on mastery, not seat time

- Students must obtain mastery on every mastery assignment for a course to receive credit

- Master is defined as successful completion at a rate of 90% or higher on the academic benchmarks or higher

- Less than 90% completion = work in progress

- MC Squared's Nela Park Campus houses the first high school based MIT 'FAB LAB'. The 'FAB LAB' (fabrication lab) allows a student to be imaginative and innovative when working on class projects and activities.

The students also have access via videoconference to view and interact with the other global FAB LABs.

- Biosphere 2 – all 10th grade students spent a week in Arizona at the Biosphere 2 conducting research on DNA to continue DNA genome research that began in Cleveland with Hiram College.

Where We Are Today

MC Squared STEM prepares high school students for 21st century workforce demands by exposing them to the design challenges and practices that are modeled after today's STEM industries. Students build the critical thinking and problem-solving skills necessary to effect change as they grapple with these challenges, wrestle with questions, formulate ideas, and defend perspectives alongside their instructors, peers, and field experts. The implementation of a year round school calendar model, with 10-week quarters and 3-week breaks, provides students with college-level and professional experience and is an effective way to reduce learning loss that often occurs over long summer breaks.

Academic Program

Since August of 2008, this high school has grown by one grade level each year. Ninth, Tenth, Eleventh, and Twelfth grade students are embedded in three different regional STEM campuses. The ninth graders are hosted at the Great Lakes Science Center where they work intensely with both the Great Lakes Science Center and NASA Glenn Research Center. Ninth grade students travel to NASA Glenn Research Center to experience job shadowing, internships, and hands on work with NASA engineers. The tenth grade students attend school at GE Lighting's Nela Park Campus and work

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intensely with GE employees of all professions. The focus in the first two years is a rigorous integrated curriculum that is informed by a breadth of industry experiences. Students participate in multiple field experiences on the STEM industry campuses where they are immersed in a world of hands-on learning and exploration. By the end of tenth grade, students will have participated in at least five meaningful experiences in the STEM Fields.

In the 9th and 10th Grade, MC Squared STEM High School issues units of high school credit based on the demonstration of mastery of specific content benchmarks. As required by the school's design principles, students are expected to demonstrate mastery of the curriculum in multiple ways, and no one single measure of achievement alone will be considered an appropriate demonstration of content mastery for the purposes of awarding these Carnegie units. Standards for awarding credit by demonstration of mastery were developed in consultation with the Ohio Department of Education, in compliance with the then approved State Board of Education plan for granting high school credit. This mastery based grading system ensures that every student has a strong grasp of the foundational elements of MC Squared's college preparatory STEM curriculum (See Table 1 below).

The Eleventh and Twelfth grade curriculum is designed to offer students individualized experiences. Since students spend the first two years of high school exploring STEM fields, by eleventh grade they are ready to identify areas of individual interest. The Junior/Senior experience is informed by Downtown Cleveland which serves as the campus for students. The students' academic experiences include a combination of college courses (when ready) and college preparatory instruction at the

Junior/Senior site. Many students will have the opportunity to complete all junior and senior year high school requirements while attending a college campus and interning within a STEM industrial partner. These students are required to participate in structured seminars and ongoing counseling to ensure a successful transition to college upon graduation from High School.

Curriculum

All students are enrolled in a college preparatory curriculum consisting of the following courses (students who participate in early college programing may substitute comparable college level coursework for MC Squared course requirements) See Table 1.

Table 1: Graduation Requirements

Required Courses	Credits
Mathematics Algebra II*, Geometry*, Statistics*, Pre-Calculus, Calculus	4
English English 1*, 2*, 3, and 4	4
Science Physical Science*, Physics*, Biology*, Chemistry, Science Elective	5
Social Studies World History*, American History*, Government*	3
Engineering (Principles of Engineering*, Introduction to Engineering Design*, Digital Electronics)	3
Fine Arts	1
Foreign Language	2
Physical Education	0.5
Health	0.5
Senior Seminar	0.5
Electives	0.5

*denotes part of 9th and 10th grade core. Evaluated on Mastery based system

Other graduation requirements include: Successful Completion of GE Sophomore

Project, Internship, Senior Project, Graduation Portfolio, and 60 hours of

Community/STEM Service hours.

School Schedule

In most school environments, the schedule is established and then students and

teachers race to see how much content can be covered in the set time. Time is the

constant and when students learn and know is the variable. At MC SQUARED STEM,

time is viewed as the variable and what students know is the constant. This approach

requires a flexible schedule rooted in the understanding that there is a balance between

typical class instruction in the content areas and specific trans-disciplinary project time

embedded into the school day. A sample schedule for a 9th and 10th grader at MC

Squared can be found in Table 2 below.

Table 2: Sample 10th Grade Schedule

Time /Subject	9:00	9:10	9:10		11:20	11:20	12:00	12:00	12:48	12:48	1:36	1:36	2:24	2:24	3:12	3:12	4:00
English	Advisory Breakfast		Project Time		Lunch			A		C		PLAN		B			D	
Social Studies	Advisory Breakfast		Project Time		Lunch			B		D		DUTY		PLAN			A	
Math	Advisory Breakfast		Project Time		Lunch			PLAN		A		C		DUTY			B	
Science	Advisory Breakfast		Project Time		Lunch			DUTY		B		D		C			PLAN	
Engineering	Advisory Breakfast		Project Time		Lunch			C		PLAN		A		D			DUTY	
Chinese	Advisory Breakfast		Project Time		Lunch			D		DUTY		B		A			C	

In this example, the subject designation represents the teacher and the letters A, B, C, and D represent heterogeneous groups of between 20 and 25 students. These groups remain essentially the same for at least one quarter but may change at the quarter based on student need and rearrangement for the upcoming project. The schedule changes daily to accommodate the needs of the students. Sometimes project time is longer and the classes are shorter. Sometimes project time is eliminated and classes are lengthened, and sometimes certain classes are team taught or eliminated. All this is based on the needs of the students as determined by data collected from the students.

In addition to the planning and duty time identified in the example above, teachers are required to report to school early on Tuesdays and Wednesdays to participate in the collaborative planning from 8:10 AM – 8:50 AM and required to stay late on Thursdays from 4:00 PM – 6:00 PM in order to receive on going professional development. In addition to the daily extended time teachers are also required to participate in quarterly,

week-long Professional Development Institutes the first week of each quarter break. These changes in work conditions and other changes are addressed in a Memorandum of Understanding between the Cleveland Teachers Union and the Cleveland Metropolitan School District (See Appendix A).

Early Indicators of Success

MC Squared and the CMSD have accepted the challenge of developing and running the kind of school that 21st century students need. By current accounts, the school is headed in the right direction. Students achieve at high levels, processes and protocols for partnership development and curriculum delivery have begun to spread to other schools and educational entities, and observers that visit are impressed by the students that they meet and talk to. The school has begun to garner national and international attention for the work that we are doing. We attribute the student growth to rich trans-disciplinary, project based experiences, strong community connections with the school, a mastery based grading system, a year-round school calendar, authentic STEM experiences, a college preparatory curriculum, and a culture of support. We measure the number of students who pass OGTs on time, the number who reach masteries, attendance rates, and how satisfied students are with their school experience and visitors are satisfied.

We tell them that 100% of our students qualify for federally subsidized meals, 81% of our students are students of color, and that no one had to pass a test to get into this public school. We show them the comparisons between our students' scores on the 8th grade tests when the students were in 8th grade and their scores on the 10th grade tests when they were in 9th grade (see Table 3).

TABLE 3: MC Squared STEM High Class of 2012 Performance on 8th Grade Ohio Achievement Tests Taken Spring 2009 and Performance on 10th Grade Ohio Graduation Test Summer 2009

	8th Grade Ohio Achievement Test	10th Grade Ohio Graduation Test
Reading	68%	86%
Math	55%	78%
Writing	DNA	92%
Science	34%	68%
Social Studies	37%	76%

Background and Purpose of the Research

With a unique design and aspirations of national mimicry, it is critical that the school have a holistic understanding of the features of our school that are having the greatest impact on the growth and development of our students. Our current system for determining success does not help us to understand which features of the school model are having the greatest impact on the development of our students. As noted above, Design Principle 2 indicates that the school will use "multiple metrics to measure success." Currently, we are set up to be measured by how well our students perform on the required state tests. Ohio Graduation Tests (OGTs) are the primary method by which schools in Ohio are graded for performance and how most people in the community rate the success or failure of a particular school or school system.   According to the Ohio Department of Education (http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEPrimary.aspx?page=2&TopicRelationID=9)

Ohio Graduation Tests (OGT) are a key part of Ohio's education reform to

establish an aligned system of standards, assessments and accountability

for Ohio schools. The testing requirements were established by the Ohio

General Assembly in 2001 based on recommendations by the Governor's

Commission for Student Success. Tests in reading, writing, mathematics,

science and social studies make up the OGT. The purposes of the OGT

are to: Ensure that students who receive a high school diploma

demonstrate at least high school levels of achievement; Measure the level

of reading, writing, mathematics, science and social studies skills expected

of students at the end of the 10th grade; Meet federal requirement for high

school testing.

<div align="right">(ODE 2012)</div>

While I appreciate the effort by legislators to attempt to align standards,
assessments, and accountability, their efforts have failed to adequately address the
needs of students who hope to compete in the 21st century. In addition to other
short comings, the OGTs:

- Do not measure critical thinking.

- Do not measure students' ability to solve complex problems as part of a team.

- Do not measure the students' ability to utilize technological tools to access
  available information, analyze the information for biases, and formulate a position
  based on the information.

- Do not measure students' ability to effectively communicate their findings to
  various audiences in various ways.

What the OGT does measure is students' ability to respond to a series of low level
questions in five discrete subject areas. This current standard only measures a small
portion of what is required in order to fully prepare students to leave high school

equipped with the knowledge and dispositions needed to be successful. If test scores are the primary goal of a school then the school will fall well short of preparing its students for success in the 21st century. We cannot prepare leaders for the 21st by tweaking 20th century methodology.

Twenty years ago, it may have made sense to use a test to try to standardize learning and achievement. Over one-hundred years ago it made sense to standardize learning by establishing the Carnegie units as the primary measure of student progress. It is no longer adequate to measure student growth using either of these measures. With advances in technology, advances in the understanding of cognitive development, and an increasing understanding of what the careers of the 21st century will require people to be able to accomplish, we know that the definition of what is good education today is different from the definition of what was good education in the past.

There has been much conversation about "twenty-first century" skills. Tony Wagner suggests that students (even in "the best schools") are not being prepared for leadership in the future. Wagner (2008) defines the seven survival skills that all students need as:

1. Critical thinking and problem solving

2. Collaboration across networks and leading by influencing

3. Agility and adaptability

4. Initiative and entrepreneurialism

5. Effective oral and written communication

6. Accessing and analyzing information

7. Curiosity and imagination

In order to prepare students for the 21st century it is necessary to provide the kind of learning environments that support development of these skills. The use of technology is one agreed upon way to prepare students with the necessary skills. Partnership for 21st Century Learning (2007) presents the following as suggested ways that technology can promote mastery of 21st century skills:

1. Promote greater student achievement
2. Increase student engagement
3. Assess of student progress
4. Facilitate communication and collaboration
5. Maximize administrative effectiveness
6. Build student proficiencies in 21st century skills

While these test scores are important, they do not measure all areas in which students must grow in order to be prepared for successful life as a leader in the 21st century STEM fields. To be successful in these fields and in life, students need to do more than perform well on standardized tests. They need to be more than good test takers. In addition to being strong academically, they need to be well developed with 21st century skills, motivated, social engaged, and capable of self-management.

Successful corporations and private companies have figured this out. Employers understand what they are looking for from employees. While academic performance plays a role in the determination, there are many other factors that the employer is considering based on shifts in organization and management necessary to run effective 21st century operations. According to 21st Century Skills for 21st Century Jobs, the

following table 4 put together by Stuart 1999 (p, 3) compares the old system to the new system.

Table 4: Changing Structures Due to Shifts in Organization and Management

Element	Old System	New System
Workplace Organization	Hierarchical Function /Specialized Rigid	Flat Networks of multi/cross-functional teams Flexible
Job Design	Narrow Do one job Repetitive/simplified/ standardized	Broad Do many jobs Multiple Responsibilities
Employee Skills	Specialized	Multi/cross-skilled
Workforce management	Command/control systems	Self-management
Communications	Top-down Need to know	Widely diffused/Big Picture
Decision making /responsibility	Chain of command	Decentralized
Direction	Standard/fixed operating procedures	Procedures under constant change
Worker autonomy	Low	High
Employee knowledge of organization	Narrow	Broad

MC Squared STEM's approach to education is supposed to provide the kind of environments that allow students to experience holistic growth towards future leadership in the 21st century. Teachers, administrators, and other school personnel who create and work in this school can sense the impact that they are having on the students who are fortunate enough to attend. The students recognize the growth they are making and their parents do too. Even the outside personnel that spend any significant time in the schools understand that something different and good is happening in these schools. When visitors come they often can feel it. But what exactly are we doing that is supporting this

type of change within our students? While MC Squared has begun to receive recognition for its work preparing students for the 21st century STEM fields, to date, no research has been done to uncover the components of this innovative model that are having the greatest impact on the growth of the students. We need to gain insight into which practices are having the greatest impact on the observed changes that are taking places within the students of the school.

One hypothesis that seems to be supported by Robbins et al. 2004 is that episodic, siloed interventions, no matter how well implemented, are no better than minimally impactful on student outcomes and that truly transformational interventions are interwoven into the very ethos of a child's school. Because so much of what happens at MC Squared happens simultaneously, it is difficult to isolate the factors of the system that might be more meaningful to the student's development that others. To that end it is necessary to understand how students perceive their high school experience and attempt to identify the factors or interactions that have had the most meaningful impact on their remarkable development. Some of these experiences have been episodic and some have been organic and ongoing.

<div align="center">The Research Question</div>

By standard academic measures, students at MC Squared are outperforming their peers in other schools. At the same time, the culture and curriculum of the school support the non-academic as well as academic development of the students.   Thus the primary question for this study is:

 How and in what ways do the non-academic factors of the MC Squared experience contribute to students' academic success?

The question will be addressed and framed by three non-academic determinants for

student success: Motivation, Social-Engagement, and Self-Management.

CHAPTER 2: REVIEW OF LITERATURE

Introduction

This literature review looks at the key components that have been identified by researchers on what helps students reach their academic potential within their learning community. This research focuses on four main areas:

- Academic Achievement

- Motivation

- Social Engagement

- Self-Management

    (Robbins et al 2004)

There have been numerous studies done about the factors that lead to student success in school. In one particularly well-controlled analysis, Robbins et al. (2004) examined 109 prospective studies in which various psychosocial and study skill factors (PSFs) were used to predict college outcomes. The predictors were categorized into nine broad constructs, such as academic self-efficacy, achievement motivation, academic-related skills, and academic goals. The constructs which Robbins et al. referred to as Psychosocial and Study Skill Factors (PSFs) can be broken down into four primary domains: Motivation (the desire to get work done), Social Engagement (the ability to interact appropriately with different groups of people in different types of social settings), Self-regulations (the ability to self-manage ones emotional state and maintain focused on the task at hand), and Academic-related skills (the processing schema necessary to accept new concepts and transfer those new concepts from one situation to another). This is the

theoretical underpinnings for this chapter and will serve as support for the proposed

research project of this dissertation.

<div align="center">Learning in the Flat World</div>

Thomas Friedman (2005) refers to the rapid technological advances that have

occurred over the last 20 years as the Flattening of the World. In his book he argues that a

new era of information access has profoundly transformed the manner in which the world

operates.

> And that is why I argue in this book that around the year 2000 we entered
>
> a whole new era: Globalization 3.0. Globalization 3.0 is shrinking the
>
> world from a size small to a size tiny and flattening the playing field at the
>
> same time (p. 10).

Information technology boomed during the second half of the 20th century,

leading the transformation to the conversion to the information economy. The revolution

of reformed teaching practices due to this new system and access to information has not

kept pace with the current educational system. Today, pedagogy and approach to the

child in our schools has continued to have challenges in progressing, some examples of

practice include: a) teachers still use the same overhead projectors and teach the same

lessons that they taught 20 years ago; and b) if they are adapting to smart boards, they

often use them in the same capacity as an overhead projector. Today's schools' eco-

system is still based upon the old "widget-making" model; educators are preparing

today's students for manufacturing level jobs that are no longer available and have not

adopted the 21st century learning tool kit of the information age. The methodology to

teach our young people is static, textbook education as the center piece is obsolete – the

focus of today's learner needs to incorporate how to understand and garner knowledge in addition to storing it and leveraging it effectively. For example, history text books continue to get thicker but the same amount of time is dedicated to teaching of history and history continues to be taught in the same way. Howard Gardner (1999) describes this by saying:

> Still, apart from a few relatively superficial changes, human beings miraculously transported from 1900 would recognize what goes on in today's classrooms –the prevalent lecturing, the emphasis on drill, the decontexualized materials and activities ranging from basal readers to weekly spelling tests. (p. 41)

As Gardner so aptly points out the world has changed but formal education has not kept up. One way in which education must drastically change, since the "flattening of the world", is the way in which it views information. Gardner (1999) indicates that the amount of information in the world doubles every eight days. Students have access to more information today and have access to this information in ways that were not available to the public 20 years ago. This access to information makes it critical that education today provides students with the ability to discern meaning from large amounts of information, much of which is inaccurate or slanted based on the writer's personal bias. According to Gardner (1999), "Changes in the cartography of knowledge can boggle the mind" (p. 135). What Gardner and Friedman were saying in 1999 has become the foundation for a movement that has accelerated new technologies and adaptive learning models and styles to this new economy of information.

Students today more than any other time in history need to be able to think critically and solve complex problems. Content is important, but now it is accessible anywhere at any time ~ knowing how to use this content is the renewed manner in which today's learner needs to be trained. That factual information may make that students a better test taker but in the real tests of the 21st century knowing how to access information, determine the validity of its source, and applying the information to unique and complex situations is what is needed (Wagner, 2008). Schools have a responsibility to produce productive citizens capable of thinking critically and solving complex problems, which includes understanding how to sift through and effectively use the information that is available in today's market place. Freidman (2005) agrees when he says that, "as the nation has industrialized, there is an increasing premium for pattern recognition and complex problem solving and a diminished premium of physical strength" (p. 288).

If schools want to exist well into the 21st century then they will need to change the frameworks from which they operate. In 1998 George Wood told us what needed to happen in order to address the growing concern.

> If we are going to get serious about having the high schools that our children and communities deserve, we must rethink the entire culture of high school in our attempt to make it a place where young people can develop the habits of heart and mind that are required of citizens in a democracy. (Wood 1998, p. 11)

While educators work to create the types of schools needed in the 21st century with the new technology and our understanding of evaluation, there must also be new

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measures of accountability that are data-driven. The values of data-driven measures to

assess school performance became popularized with NCLB (the No Child Left Behind

Act). As the informational landscape has changed, so has the way that the public looks at

the successes or short comings of schools. State reports cards and federal benchmarks

allow parents and communities access to information that was just beginning to be

present 20 years ago. While this new level of accountability is welcomed, at times the

implementation of said accountability measures has been counterproductive to the

demands placed on schools. Linda Darling-Hammond (2004) describes this conundrum:

> Ironically, States that use more ambitious tests and have higher standards
>
> will experience greater failures than those with low standards, and many
>
> have abandoned measures of critical thinking and performance, just as the
>
> labor market increasingly demands these kinds of skills. (p. 15)

Education as we know it is at a critical juncture. The 21st century provides us

with a tremendous opportunity to build on the new assets of today (e.g. easy access to

information) and to redesign our supply and natural talent to our ever-changing

landscape. If we do not lead our schools into the 21st century, public schools as we know

them will cease to exist (Schlechty, 2001). The first schools to go will be the failing ones

but eventually even the highly effective schools will disappear if they do not enter the

21st century.

The purpose of the study is to assess the change and interrelationships of

predominant student characteristics known to be associated with student achievement.

The student characteristics that will be included in this study are academic interest,

engagement and achievement, motivation, self-management, wellbeing, career

development, and social engagement. The remaining sections in this chapter discuss

factors impacting potential student achievement and are summarized in Table 5.

Table 5: Factors Impacting Potential for Student Achievement

Factors	Non Academic / Academic	Definition
Motivation	Non Academic	"Academic motivation" is defined as 1) academic drive 2) attitudes toward school and learning, and 3) enthusiasm for academic achievement (Le et al., 1995).
Social Engagement	Non Academic	The research defines social engagement as social connectedness, team work and social activity (Robbins, 2004).
Self-Management	Non Academic	Academic self-management is control over internal and external factors influencing academic performance, including perspectives, characteristics or behaviors (Dembo, 2000).
Academic Achievement	Academic	Academic achievement is the extent to which a student, teacher or institution has achieved their educational goals. Academic achievement is commonly measured by a variety of assessments. However there is no formal agreement on how it is best tested or which aspects are most important.

Theory and research suggest that academic achievement hinges on motivation,

confidence, engagement, prior achievement, and healthy living; these are the

foundational components for student success and career advancement. The

association between motivation and achievement is well established and based on a

comprehensive literature review spanning two decades, the CDC (2010) and others

found that increased physical fitness and improved diet is associated with substantial

gains in students' academic achievement and academic motivation. Evidence

regarding the impact on cognitive performance and academic achievement of

nutrition and exercise (Meredith et al, 1991), obesity (Taras and Potts-Datema, 2005)

and sleep (Taras and Potts-Datema, 2005) are well documented in the literature.

<div align="center">Motivation</div>

"Academic motivation" is defined as 1) academic drive 2) attitudes toward school

and learning, and 3) enthusiasm for academic achievement (Le et al., 1995). MC

Squared has centered the study around academic motivation and self-Regulation,

academic goal valuation, and academic control and relevance of school work. Table

6 lists critical concepts explored within the context of motivation.

<div align="center">**Table 6 Critical Concepts Explored with the Area of Motivation**</div>

Factors	Non Academic	Critical concepts explored (Major Author)
Motivation	Non Academic	• Maslow's Hierarcy of Need (Maslow) • Self-Efficacy (Bandura) • Achievement Attributes (Weiner) • Locus of Control (Dweck) • Expectancy Value Theory (Eccles) • Goal Theory (Elliot/Ryan) • Intrinsic/Extrinsic Motivation (Deci/Ryan) • Flow (Csikszentmihalyi) • Achievement (Malmburg) • Integrated Approach (Ford) • Implications for Current Research

It has been long known that factors other than ability influence whether students

seek or avoid challenges, whether they persist or withdraw in the face of difficulty, and

whether or not they use and develop their skills effectively (Dweck, 1986, p. 1040).

According to Eccles (1991), motivation means "to move" toward values and goals. The

<div align="center">33</div>

motivational processes influence students' ability to learn and apply knowledge (Dweck 1986, Ames 1992,) Motivation is a critical component of this construct. At the heart of the association between motivation and achievement is the assertion that children who believe they can achieve a goal are motivated to engage in behaviors leading to that goal, are more likely to behave with greater goal-oriented effort and persistence, and are ultimately more effective in achieving the goal. Research suggests that each of the three motivational elements must be considered when employing motivation to predict achievement. A number of models have been explored to this extent in the literature.

 Maslow's Hierarchy

The understanding of motivation assumes that a person's basic humanistic needs are being met. Maslow's Hierarchy of Needs (Maslow, 1962) depicts the levels of humanistic need, both psychological and physical. An individual achieves self-actualization by climbing the steps of the pyramid of needs. The bottom of the pyramid comprises a human being's "basic" needs of food and water. The next level is "Security and Stability". These two steps are important to the survival of the person physically. Once an individual has basic nutrition and shelter then they have reached a state that will allow them to look to accomplish more. The third level is "Love and Belonging", a psychological need, understood as an individual's desire to share himself with others once his physical needs have been met. The fourth step occurs when the person feels comfortable with what they have accomplished; this is the "Esteem" level, which represents success and status. The top of the pyramid is "Self-actualization" that occurs when it is believed that the individual has reached a state of harmony and understanding. Maslovian needs must be meet to some degree before motivation in a student can be

scrutinized. Often a student who does not have these basic needs met cannot engage in reaching for their goals, have authentic personal agency or use this context as a healthy support system. Motivation actualization builds from the existence of a healthy foundation in the Maslovian pyramid. MC Squared STEM students come from a region with significant economic hardships: Cleveland has been named the "poorest big city in America" for the second time in three years (Suchetka & Galbincea, 2006). Based on the 2010 U.S. Census, Cleveland leads the nation with the lowest median household income and highest poverty rate at 30.2%. The 2005 U.S. Census also shows that fifty-one percent (51%) or 91,220 households residing in the target area have incomes at or below 150% of the poverty level compared to twenty-eight percent (28%) of the households in Ohio, and twenty-seven percent (27%) of the households in the United States. In this research it is important to recognize that many of the students come from this extreme poverty and as a result are initially focused on basic needs with educational success secondary.

Foundational Research on Motivation

Much of the foundational work on current theoretical perspectives of motivation is based on research published during the 1970s and 1980s. This research can be organized into four major arenas: confidence related beliefs, goal theory, intrinsic/extrinsic motivation, and achievement. This section of the paper will explore each of these areas in relation to the core theoretical perspectives, how these perspectives manifest themselves in the academic environment of schools, and what implications this will have on individual development within the context of the school.

The construct of confidence related beliefs can be described as what one expects to accomplish and the level of persistence that one maintains while attempting to accomplish a task. Theories postulate that motivation is linked to one's personal beliefs about ability, the environmental inter-play of belief, action and external impact, and an individual's social cognition as it relates to interpretation of self in a given point of time.

Bandura (1986, 1989) defined self-efficacy as individuals' confidence in their ability to organize and execute a given course of action to solve a problem or accomplish a task. He characterized it as a multidimensional construct that varies in strength, generality, and level (or difficulty). Bandura's self-efficacy theory focuses on expectancies for success. He distinguished between two kinds of expectancy beliefs: outcome expectations, beliefs that certain behaviors will lead to certain outcomes (e.g., the belief that practicing will improve one's performance), and efficacy expectations, beliefs about whether one can effectively perform the behaviors necessary to produce the outcome (e.g., "I can practice sufficiently hard to win the next tennis match"). Bandura proposed that individuals' efficacy expectations are the major determinant of goal setting, activity choice, willingness to expend effort, and persistence. Efficacy self-views thus help explain why performances differ among people who have similar knowledge and skills. Consistent with the specificity notion, Bandura (1986) posits that self-efficacy judgments should be directed rather than globally assessed, must correspond directly to the criterion task, and must be measured as closely as possible in time to that task. Understanding the general level of individual efficacy expectations will help in guiding the direction of educational experiences for students and the framing of these experiences within the individual and school context. This process provides micro-narratives to be

joined together to create an individual macro-narrative that students can draw on to feel

that they have greater control over their direction (Savikis, 2008)

According to Bandura (1994), there are four major sources of self-efficacy:

mastery experiences (performing a task successfully strengthens our sense of self-

efficacy), social modeling (witnessing like people successfully completing a task), social

persuasion (persuading someone that they can succeed), and psychological responses

(how individuals respond to a given situation and what emotional reactions may take

place in the process).

Bandura's self-efficacy model has potential for wide application in learning and

development situations. The notion that some students may be resistant to academics

because they do not believe themselves capable of success, no matter the effort, is an

important path of exploration in the area of self-efficacy. Self-efficacy has also been

linked to student development and success in schools through the relationship between a

student's belief structure and behavior; this provides another point of entry for support or

intervention.

Weiner and his colleagues (Weiner, 1992) identified ability, effort, task difficulty,

and luck as the most important achievement attributions. They classified these attributes

into three causal dimensions: locus of control, stability, and controllability. The locus of

control dimension has two poles: internal versus external locus of control. The stability

dimension captures whether causes change over time, and describes what influences these

changes have on various aspects of achievement behavior. The stability dimension

influences individuals' expectancies for success: attributing an outcome to a stable cause

such as ability or skill has a stronger influence on expectancies for future success than

attributing an outcome to an unstable cause such as effort. The locus of control dimension is linked most strongly to affective reactions. Dweck (1986) refers to this as the combination of adaptive and maladaptive patters. Adaptive motivational patters are those that promote the establishment, maintenance, and attainment of personally challenging achievement goals; whereas, maladaptive motivational patterns are associated with a failure to establish reasonable, valued goals, or, ultimately, to attain valued goals that are potentially within one's reach.

Skinner (1957) postulated that those who feel in control of their environment are more highly motivated to achieve greater results. Skinner explained motivation in terms of deprivation and reinforcements. He believed that behavior that is positively reinforced will reoccur. He showed that stopping and starting the intervals at which you introduce the stimulus is most effective for influencing behavior and that information should be presented in small amounts so that responses can be shaped. Skinner believed that reinforcements will generalize across similar stimuli ("stimulus generalization") producing subsequent conditioning. This set of behaviors influences internal beliefs about self and yields related levels of motivation. There are a variety of ways that Skinner's work was leveraged to derive a variation of constructs/theories on motivation and the person.

Expectancy Value Model

According to Feather, Pekrun, Wingfield, and Eccles much of what researchers have learned about motivation, including implications for teachers, can be organized within an expectancy value model (Feather, 1982; Pekrun, 1993; Wigfield & Eccles, 2000). The expectancy value model of motivation holds that the effort that people are

willing to expend on a task is the product of (a) the degree to which they expect to be able to perform the task successfully if they apply themselves (and thus the degree to which they expect to get whatever rewards that successful task performance will bring), and (b) the degree to which they value those rewards as well as the opportunity to engage in the processes involved in performing the task itself. In contrast to the mixture of expectancy values, other theories of motivation work from a single reference point and expand from there to explain some of the factors that may describe motivation.

Goal Theory

Goal theory and goal-orientation theory posits that humans set up goals, which are available at the level of consciousness, and are transformed into action when the context is conducive towards need fulfillment (Elliot, 1999; Ryan, 1995). Bandura (1997) and Schunk (1990) have shown that specific, proximal, and somewhat challenging goals promote both self-efficacy and improved performance. Dweck (1999) and her colleagues provided a complementary analysis distinguishing between performance goals (like ego-involved goals) and learning goals (like task-involved goals). Ames (1992) distinguished between the association of performance goals (like ego-involved goals) and mastery goals (like task-focused goals) with both performance and task choice.

Intrinsic/Extrinsic Motivation

Intrinsic motivation describes the internal drive that motivates an individual to engage in an activity because he or she is interested in and enjoys the activity (e.g., they perform the activity for the sake of doing it—for the enjoyment, fun, or pleasure) and not because the activity will produce a reward or result in the avoidance of a negative consequence. Intrinsic motivation "energizes important growth- fostering behaviors,

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such as seeking out challenges, exercising skills, and pursuing one's interests" (Deci & Ryan, 1985, p. 45). This "state" interpretation of intrinsic motivation suggests that a student's intrinsic motivation is amenable to environmental manipulation. Researchers are now treating intrinsic motivation as less of a situation-specific state and more of a trait-like characteristic. The highly correlated components of the trait-intrinsic motivation (as would be described in an academic context) are: (a) academic learning driven by curiosity and interest; (b) a preference for hard or challenging academic tasks; and (c) a striving for competence and independent mastery (Deci, et.al, 1991).

Another concept connected to the research based on intrinsic motivation is the concept of flow theory. Csikszentmihalyi (1988) defined intrinsically motivated behavior in terms of the immediate subjective experience that occurs when people are engaged in an activity. Expert climbers, dancers, chess players, basketball players, and composers describe their experiences when fully engaged in terms of an emotional state Csikszentmihalyi labeled "flow". Flow is characterized by (*a*) a holistic feeling of being immersed in, and carried by, an activity, (*b*) a merging of action and awareness, (*c*) focus of attention on a limited stimulus field, (*d*) lack of self-consciousness, and (*e*) feeling in control of one's actions and the environment. Flow is only possible when a person feels that the opportunities for action in a given situation match his or her ability to master the challenges. The concept of flow and the idea that opportunities for action match one's ability to master the challenge can be understood in greater detail with an understanding of achievement motivation.

Achievement

Lars-Erik Malmberg (2005) defined achievement motivation as striving for mastery based on affect, cognition and behavior. The organismic basis of achievement motivation distinguishes between need for success and fear of failure (Atkinson, 1964; White, 1959). Achievement motivation theorists focus their research attention on behaviors involving competence. Individuals aspire to attain competence or may strive to avoid incompetence, based on the earlier approach-avoidance research and theories. The desire for success and the desire to avoid failure were identified as critical determinants of aspiration and behavior by a theorist named Lewin. Elliot and Harackiewicz (1996) discuss several authors' positions on Achievement Motivation. McClelland's achievement motivation theory proposed that there are two kinds of achievement motivation, one oriented around avoiding failure and the other around the more positive goal of attaining success. Atkinson, another motivational theorist, drew from the work of Lewin and McClelland in forming his need-achievement theory, a mathematical framework that assigned the desire to succeed and the desire to avoid failure as important determinants in achievement behavior (Elliot 1996). At present, achievement goal theory is the predominant approach to the analysis of achievement motivation but mixed methods approaches are being considered.

Mixed Approaches

Most contemporary theorists use the frameworks of Dweck (1983) and Nicholls (1984) revised models in two important ways. First, most theorists institute primary orientations toward competence, by either differentiating between mastery and ability goals or contrasting task and ego involvement. One argument against the use of

achievement goal frameworks is whether or not they are conceptually similar enough to justify a convergence of the mastery goal form (learning, task involvement and mastery) with the performance goal form (ability and performance, ego involvement, competition). Secondly, most modern theorists characterized both mastery and performance goals as approach forms of motivation; i.e., they failed to consider approach and avoidance as independent motivational tendencies within the performance goal orientation (Elliot & Harackiewicz, 1996). Over time researchers have begun to look at motivation as a combination of components and aspects of each of the subcategories reviewed above. This can be defined as an integrative approach.

An Integrative Approach

Ford (1992) defined motivation as "the organized patterning of three psychological functions that serve to direct, energize, and regulate goal-directed activity: personal goals, emotional arousal processes, and personal agency beliefs" (p, 35) That is, motivation results from the interplay of goals, emotions, and the person's sense of personal control. We might translate this as: What do you want to do? How much do you care? And do you think you can actually make it so? Therefore, motivation is an interactive construct representing the direction a person is going, the emotional energy and affective experience supporting or inhibiting movement in that direction, and the expectancies that a person has about reaching their destination or achieving their goals. Ford's Motivational Systems Theory (MST), does not prefer or rank any one of the three components, but rather views all three components as functioning in an interdependent triumvirate process. If any one of the components is absent in a particular episode, then the subject will not be motivated to initiate activity even though the other two

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components are firmly in place (Ford, 1992, p. 50).   MST includes taxonomy of 24 goals arranged within six categories:

- Affective goals: entertainment, tranquility, happiness, pleasurable bodily sensations, and physical well-being

- Cognitive goals: exploration to satisfy one's curiosity, attaining understanding, engaging in intellectual creativity, and maintaining positive self-evaluations

- Subjective organization goals: unity (experiencing a spiritual sense of harmony or oneness with people, nature, or a greater power) and transcendence (experiencing optimal or extraordinary states of functioning that go beyond ordinary experience)

- Self-assertive social relationship goals: experiencing a sense of individuality, self-determination, superiority (in comparisons with others), and resource acquisition (obtaining material and social support from others)

- Integrative social relationship goals: belongingness, social responsibility (meeting one's ethical and social obligations), equity (promoting fairness and justice), and resource provision (giving material and social support to others)

- Task goals: mastery, task creativity, management (handling everyday tasks with organization and efficiency), material gain, and safety.

While goal theorists usually work with simpler taxonomies that contain just a few categories of goals, longer lists such as Ford's are useful as reminders of the many competing agendas facing teachers who seek to motivate their students to focus on learning goals. This integrative approach will serve as the preferred approach when analyzing data within the context of motivation. What is known about motivation should influence the systems and processes that govern schools. MC Squared STEM has

experienced these factors and is looking for the balance of theory to application to develop a best approach.

<div align="center">Social Engagement</div>

The research defines social engagement as social connectedness, team work and social activity (Robbins, 2004). The second non-academic determinant critically reviewed in this research in order for a student to be able to maximize his or her academic potential is Social Engagement. Social Engagement is defined as the ability to exchange information effectively with others; the ability to work collaboratively with others and; the ability to develop and maintain relationships with others. The table below outlines the critical components explored.

<div align="center">**Table 7 Critical Concepts Explored within the Area of Social Engagement**</div>

Factors	Non Academic	Critical concepts explored (major author)
Social Engagement	Non Academic	• Social Capital (Putnam) • Connectedness and Cognitive Development (Bradly) • School Connectedness (Resnick) • Team Work (Barton) • Collaboration (Wagner) • Social integration (Tinto)

Robins et al. (2004) and Lee et al. (1995) found that social connectedness is an important variable in being able to appreciably predict student success. Robbins et al. (2004) through a large scale meta-analysis studied various components that define academic success. Robbins et al.'s meta-analysis provides a unified framework for guiding the development of a comprehensive psychosocial and skills inventory. The next dimension to be discussed in this literature review is social connectedness.

Social Connectedness

Social connectedness refers to an individual's engagement in an interactive web of key relationships, within communities that have particular physical and social structures that are affected by broad economic and political force (Health People, 2020 Report, 2010). It includes relationships with family, friends, colleagues and neighbors, as well as connections people make through school, work, sport and other leisure activities, or through voluntary work or community service. Social connectedness is about the quality of the relationships and how people understand and value these relationships. It provides the foundation for the sense of belonging and feeling that drives interactions and perceptions within an environment (Baumeister & Leary, 1995). According to Putnam (2000), social connectedness and interpersonal trust are essential parts of belonging within a community and critical components of social capital. Cohen and Syme (1985) define social connectedness as made up of two separate but integrated components. The first is social resources defined as the provision or exchange of resources for those who are in need of different types of support (e.g.., emotional, informational, or instrumental support). The second component is social participation, the belonging to and/or participation in one or more distinct groups, with interactions that are not explicitly designed to exchange help or support. Participation and resource exchange in an equitable manner are critical for creating trust and shared values and experiences.

Research indicates that those with high levels of social connectedness are more able to take advantage of social opportunities and build capacity for their individual growth (Miller, 1992). Social connectedness has been demonstrated to be critical in alleviating poverty and health inequalities (Hawkley, Browne, & Cacioppo, 2005). Social

connectedness is correlated in multiple studies with more positive subjective wellbeing (Myers & Diener, 1995). Social connectedness has been shown to be a good social support and have a moderating effect on physical and psychological outcomes (Cronan, Groessl, & Kaplan, 1997). Lastly, studies have demonstrated that individuals with high levels of social connectedness have improved self-esteem, fewer anxiety and depressive symptoms, and less rejection sensitivity and social avoidance (Ashida & Heaney, 2008). Social connectedness is critical to leveraging communal existing assets and building a healthy contagion of success in a given community (Christlkis, 2008). In utilizing this new capacity it needs to be understood within the context of youth and the community.

Youth and Social Connectedness

According to Grotevant & Cooper (1998), a promising concept for understanding youths' relationships in terms of degree of involvement with and caring for others is social connectedness (Grotevant & Cooper, 1998; Youniss & Ketterlinus, 1987). Researchers describe social connectedness, or the psychological state of belonging, as occurring when individuals perceive that they and others are cared for, acknowledged, trusted, and empowered within a given context (Eccles and Gootman 2002; Whitlock 2006). Karcher (2001) stated that connectedness conveys youths' attitudes toward their larger social ecology and their degree of activity and quality of relationships within it. Jessor & Jessor (1997) describe connectedness as conventional or unconventional depending on whether the activities or people with whom a youth is connected endorse socially sanctioned versus illicit behaviors. Conventional relationships, activities, and contexts place social controls against delinquent and illicit behaviors (De Civita & Pagani, 1996; Pederson, Koval, & O'Connor, 1997; Turbin, Jessor, & Costa, 2000).

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Townsend and McWhirter's (2005) review of the connectedness literature noted definitions ranging from observable characteristics (e.g., embeddedness or integration in social networks) to subjective psychological states (e.g., belonging, affiliation). School connectedness is an umbrella term used to describe a student's relationship to a school, although numerous overlapping terms and definitions have also been used, such as school engagement and school bonding (Libbey, 2004). Connectedness to parents and teachers serve as controls against risk-taking by encouraging conventional behaviors, beliefs, and attitudes (Bonny, Britto, Klostermann, Hornung, & Slap, 2000; Hendry & Reid, 2000; Karcher, 2002). Conversely, connectedness to peers, siblings, and friends more often reflect relationships and behaviors that are not structured or supervised by adults, and therefore place fewer controls or constraints against risk-taking behavior (Karcher, 2001; Stanton & Silva, 1992). Barber and Schluterman's (2008) literature review revealed four common conceptualizations of connectedness for children and youth: the quality of a relationship (e.g., family bonding), the degree of liking of an environment or relationship (e.g., liking school), a feeling or attitude (e.g., sense of belonging), and a combination of feeling and antecedent conditions (e.g., feeling close to people). Being connected provides purpose, meaning and embedded accountability to individuals and communities. The same capacities leveraged in understanding the connection to context for the physical space must also be explored within the internal workings of the young person.

Connectedness and Cognitive Development

Brain development is a complex and important component of the developmental

process a teen endures during their tenure in high school. During adolescence parts of the

brain begin to develop and they continue to develop into a person's early to mid-twenties.

Bradley (2003) describes how adolescent brains experience a period of rapid

development in the corpus callosum. This part of the brain is a set of nerves that

connects the two hemispheres of the brain that must work together to function efficiently,

as in making good decisions. This set of "wires is critical to things like intelligence,

conscientiousness, and self-awareness". (P.6) Bradley 2003 goes on to explain that

while the corpus callosum is experiencing rapid development during adolescence so too

is the prefrontal cortex, where emotional control, impulse restraint, and rational decision

making occur. This means that high school students must face all of the external

challenges of being a teenager while also internally depending on parts of their brain that

are not yet fully developed to address these challenges rationally. Furthering these

challenges, these biological changes, coupled with the additional pressures that urban

students of poverty experience and it is a minor miracle that some students make it. The

lack of support that they experience in their lives severely limits their chances of

successfully navigating these formative years. Understanding the physical and chemical

changes an adolescent is undergoing is critical to managing and connecting a group of

young people in a manner that reflects upon these important "unseen" changes.

School and Connectedness

Schools have the opportunity to play a critical role in the establishment of

boundaries and the development of healthy relationships to support students' needs

during this critical time. Schools cannot do this unless they accept their obligation to socially and emotionally support students. Schools that support social connectedness provide opportunities for students to grow emotionally strong and establish the social capital they severely lack.

Researchers began to focus on *school connectedness* (also called school bonding) as an important variable in reducing risk for violent behavior. School connectedness is defined as the degree of caring that students experience at school and the sense of closeness to school personnel and environment that occurs (Resnick et al., 1997). School connectedness is concurrently and prospectively associated with fewer internalizing and externalizing problems, including emotional distress, anxiety, depressive symptoms, substance use, general behavioral functioning, and violence (Shochet et al. 2006; Resnick et al. 1997). In a recent review of the school bonding literature, Maddox and Prinz (2003) noted that the influence of school connectedness on students' adjustment may vary by gender. Researchers have found a direct relationship between school disconnectedness and outcomes such as delinquency, truancy, drug use, and a number of physical and mental health indicators (Bonny, Britto, Klosterman, Hornung, & Slap, 2000). Adolescent connectedness to school has been found to reduce the prevalence of deviant and delinquent behavior (Dornbusch, Erickson, Laird, & Wong, 2001; Murray & Greenberg, 2001), a finding that persisted for affluent as well as economically deprived communities (Dornbusch et al., 2001), and for students with and without disabilities (Murray & Greenberg, 2001). School connectedness has been conceptualized as malleable, resulting from a student's interaction with his or her environment (Fredericks et al., 2004). Highly structured environments with high expectations for students'

behavior are associated with school connectedness, whereas strict and arbitrary discipline procedures negatively impact school connectedness (Furlong et al., 2003; McNeely et al., 2002). School connectedness has many benefits for the student as well as the institution. These benefits can be seen manifested in the relationships and perceptions of the institution and the students.

Benefits of School Connectedness

Students who feel close to others, perceive themselves fairly treated, and are vested in school are less likely to engage in risky behaviors than those who do not (Resnick et al., 1997). Positive connections to teachers and peers may serve as protective factors in reducing long-term negative outcomes (Furlong et al., 2003; Osterman, 2000). Traditionally, research on school involvement has focused on drop out, academic and discipline problems, and disengagement, whereas more recent work has begun to focus on the protective factors such as school engagement, school bonding, and school connectedness or attachment (Furlong et al., 2003). The effects of school connectedness often vary by gender, and these gender differences have important implications for academic outcomes (Dotterer, McHale, & Crouter, 2009; Voelkl, 1997). The relationship between gender and school connectedness is complex. Several studies indicate that girls tend to report better school connectedness than boys (Voelkl, 1997). School connectedness has also been found to be strongly and inversely related to future self-reports of depression (Shochet et al., 2006). Moderate levels of school engagement and participation, in comparison to low levels, have been positively correlated with grade point average and development of supportive relationships with teachers and peers (Jennings, 2003). In addition to school factors that predict school connectedness,

individual difference variables have also been examined. For example, student

involvement in extracurricular activities has also been associated with greater school

connectedness (McNeely et al., 2002). Students' affiliative motivation, defined as a stable

and enduring tendency to want to form and maintain relationships with others, has been

positively associated with school connectedness (Hill & Werner, 2006). Connectedness is

critical in keeping the student engaged and involved in the school on multiple levels.

Staying connected in part has to do with social capital and the ability to translate this into

functional opportunities.

Social Capital and Connectedness

In addition to the benefits associated with direct social connectedness with the

school is the opportunity for individual students to build their personal social capitol

through fully accessing the school's social capital. Putnam (2000) explains social capital

as the collective value of people's interactions with one another, and the reciprocity that

results from these interactions in a norm conscious community. According to Bourdieu

(1986), social capital is linked to other types of capital, such as cultural capital, which is a

collection of non-economic forces including family, education, and social class. He looks

at an individual's social capital which is determined by the size of his or her relationship

network, the sum of its cumulated resources and how successfully the individual can set

those resources in motion. Bourdieu (1986) defines social capital as "the aggregate of the

actual or potential resources which are linked to possession of a durable network of more

or less institutionalized relationships of mutual acquaintance and recognition "(p.246).

Bourdieu's concept of social capital provides access through social connections to

economic and cultural resources via the relationships and networks that people form. The

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development of social capital is critical for the long term success of every student, and it cannot be supported by the school if the student does not first experience social connectedness with the school. Programs such as PSEOP or external internships provide a natural extension and development of social capital that can be transferred over time directly or can act as a training opportunity for understanding the social eco-systems that exist and a student may interface with again in another setting.

Putnam (1995) hypothesized that the more we connect with other people, the more we trust them, and the more they trust us. Students who report caring and supportive interpersonal relationships have more positive academic attitudes and values and are more satisfied with school. Research shows that when adolescents grow up in an affluent, upper-class neighborhood, they are more likely to maintain higher academic expectations for themselves as opposed to youth growing up in overpopulated communities with high rates of poverty and violence (Cooley-Strickland et al., 2009). High school students are influenced by various cognitive and social agents that determine their academic and social outcomes; but connectedness outside of the school is a critical support system that can further enrich a student's success. Research has shown that extracurricular activities (academic and non-academic) can act as a protective factor for students, especially for minority students from urban schools (Daly, Buchanan, Dasch, Eichen, & Lenhart, 2010). Engagement in these activities can have many positive implications for students' educational success, such as "increased student engagement, academic achievement, and prosocial behavior" (Daly, et al., 2010, p. 20). Overall activities where academic mentorship occurs, such as PSEOP and internships, lead to a higher level of social connectedness and thus better school performance.

Social capital and connectedness has been clearly linked to helping to the improvement of school performance as well as impacting health, sense of well-being, and crime (Halpern, 2005). Organizational social capital and school connectedness is important in converting resources into tangible outcomes (Andrews and Edwards, 2004) and can be converted in many ways to authentic means. Building communities within the school is important but critical collective social capital and connectedness is best facilitated through institutional relationships (Schneider, 2008). Building opportunities for individual students via external programming builds trust and appreciation for the existing community and organically embeds additional mentors and caring adults in the lives of high school students engaged in these programs.

As clearly noted in this section, having a sense of connectedness has positive effects on academic achievement and keep students coming to school (Blum & Libbey, 2004). Academic skills come from learning and connectedness -- they do not grow in isolation, but are dependent on social and emotional development. Student performance (efficacy and academic outcomes) can be positively influenced by the learning environment and connectedness. Students who feel safe and connected can rise to the high standards educators set when supported in a healthy manner. Student success rates through intentional collaboration and efforts for connectedness can create a seamless path for students as they move from one level to the next. This level of connectedness and social capital is often best operationalized in teamwork.

Teamwork

Teamwork is a major component in social development. It has become widely accepted that teamwork is one of the most important skills needed for workforce

readiness in the 21st century (Barton, 2007) Benders, Huijgen, & Pekruhl, 2002 assert in their research that in most cases teams outperform individuals. In 21st Century Skills for 21st Century Jobs (1999) the call is made for education to include the following components*:* Basic Skills, Technical Skills, Organizational Skills, and Company Specific Skills. A major component of organizational skills defined in this report is the ability of the employee to relate to others and to function as an effective member of a team. Models of teamwork differ in their granular approach, and conceptual correspondence among the components of teamwork models suggest five general content areas (O'Neil et al., 2003; Stevens & Campion, 1994). These content areas are (a) task related process skills, (b) cooperation with other team members, (c) influencing team members through support and encouragement, (d) resolution of conflicts among team members via negotiation strategies, and (e) guidance and mentorship of other team members. These content areas are critical for building strong and effective teams.

Wagner (2008) states that companies have transitioned from a "command and control" hierarchical leadership structure to one that empowers the worker to make collaborative decisions and co-create on multiple levels with their peers. The research that reflects the practices in the work world are critical for training today's student to be tomorrow's worker. The team effectiveness literature has shown positive links not only to individual and team-based outcomes (Johnson et al., 2006; Kirkman & Rosen, 1999; Mathieu & Schulze, 2006), but also to organizational variables such as innovation (Gibson & Gibbs, 2006). Despite the new emphasis in the work world on the importance of teamwork, graduates are ill prepared for this environment and have a steep learning curve upon their entry to the world of work. DETYA 2000 states that, although job

advertisements increasingly require graduates with good team-working skills, employers cite two of the three most common skill deficiencies among graduates as the lack of communication skills and the lack of interpersonal skills. In the mind of many executives today, teamwork skills go hand in hand with different approaches to leadership that schools have been slow to adopt (Wagner, 2008) and therefore students are not being prepared.

The implications of this shortfall are clear: education needs to provide more opportunities for students to work in team and collaborative environments. Schools must put students into situations that force them to learn how to work in teams to solve problems. Creating an environment that asks students to solve complex problems as members of teams is known to help students build the skills that they need to be successful in the 21st century. According to Murray (2003), team experience provides students with opportunities to improve interpersonal and listening skills, to learn effective communication, assertiveness, and as well as to hone the ability to negotiate and compromise, understand utilization of diversity, and practice conflict resolution and other social skills.

Group work is increasingly recognized as a way for students to problem solve and demonstrate transferrable skills necessary for the workplace (Hodgkinson-Williams et al., 2008; Lave and Wenger, 1991). Fellenz (2006) noted that group projects are important in developing a specialized type of social learning experience which will enhance the development of skills and knowledge relevant to real world practice. In addition to the academic benefits resulting from the critical thinking and problem solving associated with group work there are many social benefits, including: learning how to negotiate with

peers, developing social relationships, achieving better group cohesion, and exhibiting a general "esprit de corps" (Clinebell and Stecher, 2003).

People who work in teams feel a sense of commitment to each other and a heightened sense of community. Wenger (2000) argued that communities are the basic building blocks of any social learning system because they are "social containers" of the competencies that make up such a community. Wenger (2000) also advocated that as a community works more closely together it engages in shared activities and develops a greater chance of achieving a joint purpose. Members of a community of practice can then become bound through their interactions and what they produce through joint enterprise (Wenger, 1998). Altrichter (2005) noted that practice, learning, knowledge and identity are necessary for an effective community. The idea of team work developing into social learning deals with "relatedness," involving the conscious or unconscious emotions generated from shared experience in organizational life, which in turn represents a strong and continuous dynamic (French and Vince, 1999). The result is that students grow on multiple levels, and embed skills within this arena by merely doing their school work.

There is evidence to suggest that greater social learning can lead to the development of higher order cognitive skills and that these skills can be nurtured within a collaborative, or group-work setting (Ball, 1995). Students that acquire this social learning can transfer it to other areas of their life and begin to separate themselves from unhealthy behaviors they may absorb from their actual environment. Group project work also enables social learning to occur in the context of engaging and finding solutions to real life problems (Kunkel, 2002). Sherwood (2004) suggested that placing students in a

problem-centered environment may enable useful social learning and bridge gaps between theory and practice. Heywood (2000) argued that by participating in the group-work process through defining problems and articulating solutions, students have more control over subject matter and hence a greater sense of ownership and affiliation with a project and its learning outcomes. In concurrence with the above, Ball (1995) states that students in project environments learn more content, but the literature also states that other learning occurs. Students can learn a lot from the process of social interaction and collaboration (Ball, 1995; Ramsey, 2002). A number of studies have suggested that planning, managing and understanding group-work tasks are important in overcoming major problems (Bacon et al., 1999). Fellenz (2006) believed that experiencing common group-work problems are an essential part of the social learning process. There are many social learning skills that can be of transferrable value.

While the research makes a very clear case for this type work in schools, there is still a disconnect between what is needed and what is implemented in most schools. Students are accustomed to having teachers tell them what to do (Wagner 2008) and teachers are accustomed to being in control of the learning process. Further, students almost never work in teams in the traditional learning experience.

The literature cites a variety of reasons as to why collaborative learning is slow to take shape as protocol in our schools today. One reason that more schools have not immediately transitioned from the traditional lecture format of instruction is that directing problem-solving teams of students is a difficult task to accomplish and successfully managing academic group work is not an easy process. Alan Walker (1994)

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acknowledges the need for structural changes within schools if teams are going to be successful in schools:

> If teams are to become true forces for change as a form of restructuring, thinking must transcend the simplistic structures and mechanisms currently embedded in schools. It is easy to form so-called teams and then claim the school is structured "collaboratively", but unless there are major shifts in thinking, for example, about how school personnel are assessed, rewarded and supported, little real change will result (p.38-39).

On the other hand, there are challenges that can occur in the organic process of building and operating as a team. These challenges must be respected as the process moves forward.

Challenges of Teamwork

Kaldis (2007) suggests that academic teams that do not have a clear and effective structure tend to obtain the types of organization which delimit their potential and, that schools are not set up to do this (p.252). In order to understand the suggested strategies, it is helpful to understand some of the common problems. Kaldis identified three primary types of problems common among academic groups:

1) Communication and consistency: Such problems include difficulties in effective communication and coordination (due to the increased complexity of interaction, especially when the size of a group is large) and issues related to timeliness, availability, lack of commitment, responsibility, and bad task allocation.

2) Unfair contribution and lack of clear structure: Group work assessment is often considered to be unfair, because team members who contributed more get

rewarded equally to those who contributed less; there are rarely any negative

consequences for the loafer—the one who does not contribute effectively to the

group.

3) Personality conflicts and diversity: Personality conflicts and disagreements are

usually related to human nature and arise from the fact that everyone is different

and that there can be no real objectivity. Many problems in this category often

occur during the phase of selecting the group leader.

These issues can impact teamwork.

Others have also provided suggestions to achieve an effective group approach.

Holtham (2006) advocated that learning would be better achieved if groups reflected

more on the needs of all learning stakeholders, such as employers, instructors and

students. Holtham and his colleagues believe that a greater focus should be upon

understanding and developing a social learning process through group interaction which

facilitates stronger collaboration. Cox and Bobrowski (2000) suggested that student

groups should develop their own internal mechanisms including a social contract for

dealing with key issues, basic ground rules for group interaction, showing how students

participate, and finding ways to manage group conflict.

When considering the most effective structure for group work, a network

organizational structure is suggested. A network organizational structure is defined by

Stamps and Lipnack (2000) as one "where independent people act as independent nodes

to work together for a common purpose." A network comprises nodes and connections-

links. The nodes in the case of an academic team are the team members. The links

correspond to the various interactions between them.

Some of the benefits of a network which also apply to an academic team are improved performance when the task is complex and demands innovativeness, easier adaptation to changing circumstances on behalf of the members, and freedom to explore ways to work effectively instead of following predefined processes. Also, in a network structure, authority is usually gained not from a hierarchy but from the individual's recognized knowledge and skills (Stamps & Lipnack, 2000).

Most schools that have embraced the need to provide opportunities for students to work in groups solving complex problems have done so using some type of Project Based Learning (PBL) model. PBL environments differ from LB (Lecture Based) environments by the type of support and study activities that are provided. Although there is considerable variation between PBL curricula, all PBL environments share six core characteristics (Wijnia 2010, Barrows, 1996; Hmelo-Silver, 2004; Schmidt, Van der Molen, Te Winkel, & Wijnen, 2009).

First, PBL is a student-centered learning environment. Students work together in small groups (2) under guidance of a tutor (3). A problem is used as the starting point of the learning process, to activate prior knowledge (4). In addition, a large amount of time is spent on self-study (5) and only a few complementary lectures are available (6). The PBL method differs from teacher-centered, LB environments in which courses are taught to much larger batches of students with less room for student activity (Kember, 2009; Lammers & Murphy, 2002). One of the core characteristics outlined is students working in groups. Hmelo-Silver (2004) contends that, in PBL, students work in small collaborative groups and learn what they need to know in

order to solve a problem. Student-centered environments, such as PBL, explicitly

stress collaboration by discussing real-life problems in small groups.

Teamwork is critical for learning in the 21st century. Understanding how to operate in a

context that values each member's contribution yields a greater return with a collective

thinking product. Teamwork naturally takes advantage of peer to peer learning and builds

social capital while connecting the experience to a place, such as the school. This is

critical for building a loyal and accountable base of students that feels proud of their

environment. Once this base is complete, understanding how to leverage it within the

context at hand is critical. This process is call social integration.

Social Integration

Social integration represents the extent to which a student finds the institution's social

environment to be congenial with his or her preferences, which are shaped by the

student's background, values, and aspirations. Tinto (1975, 1987) proposed that increased

levels of social integration will lead to greater commitment to the institution and to the

goal of graduation (Bean, 1983). Social integration is often measured as a composite of

peer-to-peer interactions and faculty-student interactions (Kuh, 1994).

Peer interactions are particularly important with regard to social integration because

students are more likely to stay in school when they feel comfortable and connected to

other students with similar interests and aspirations (social integration) (Bean, 1980;

Spady, 1970; Tinto, 1975, 1987). Out of class contact appears to positively shape

students' perceptions of the school environment and seems to positively influence

educational aspirations (Gurin and Epps, 1975; Hearn, 1987; Pascarella, 1985) and

degree completion (Pascarella, Smart, and Ethington, 1986; Stoecker, Pascarella, and Wolfe,1988).

One form of peer-to-peer interaction that was identified as both socially important and academically important was peer teaching and participation in peer tutorial programs (Goldschmid and Goldschmid, 1976). Students who teach other students must know the material more thoroughly than if they were only studying it for themselves. Students who work with other students in this capacity feel more socially connected to their school environment (Annis, 1983; Bargh and Schul, 1980; Pace, 1990). Moreover, such students become more actively engaged with the material to be taught, which is thought to produce greater conceptual learning (Benware and Deci, 1984; Pascarella and Terenzini, 1991).

Peer-to-teacher interactions are equally important to a student's social integration. High school teachers may diminish students' aspirations when teachers' expectations for their students are lower than those of parents and students themselves. Many teachers apparently believe that certain groups of students are limited in what and how much they can learn, and they lower their performance expectations for these students (U.S. Department of Education, 2004). Understanding the framework that the teachers and other partners come to the table with is critical in building in the institutional environment and providing the correct improvements to areas where the collective attitude may not be in the best interest of the institution.

Institutional Environments

Institutional environments are also important to school climate. Student learning is higher in institutional environments that are perceived by students to be inclusive and

affirming, and where expectations for performance are clearly communicated and set at reasonably high levels (Education Commission of the States (ECS), 1995; Kuh, 2001; Kuh, 2005b; Kuh, 1991; Pascarella, 2001). The way in which an institution deploys its resources is a critical component of its institutional environment. Institutions that organize the curriculum, other learning opportunities, and support services to induce students to participate in activities leads to the experiences and desired outcomes such as persistence, satisfaction, learning, and graduation (Kuh, 2001).

Overall, social connectedness, social capital, team work and school climate provide the backdrop for how people can lean. Bransford'S (2000) learning theory posits that environment matters; for students to achieve success they must feel that they are safe and can leverage their existing assets. Recognizing these components of engagement is a critical part of building a healthy school eco-system.

Social engagement is the glue that holds the community together. It can have challenges associated with it that can diminish the success of an individual or an institution, but, if framed and studied properly, is a critical determinant for the good of the student in his or her pursuit of academic success.

<div align="center">Self-Management</div>

The final non-academic determinant reviewed for this research is Self-Management. Robbins (2004) believed that study skills and emotional control (e.g., Elliot, McGregor, & Gable, 1999; Mathiasen, 1984) were important domains reflected in the self-management. Table 8 outlines the critical concepts explored within this area.

Table 8 Critical Concepts Explored within the Area of Self-Management

Factors	Non Academic	Critical concepts explored (major author)
Self-Management	Non Academic	- Academic Self-Management (Zimmerman and Risemberg) - Self-Regulation (Schickedanz) - Social Capital and SES (Coleman) - Cultural Capital (Bourdieu) - Concentration Theory (Wilson) - Health and Well-Being (CDC) - Approach/avoidance (Elliot) - Subjective well-being (Andrews & Withey) - health-related factors such as hunger, physical and emotional abuse, and chronic illness (Dunkle and Nash)

Academic Self-Management (Zimmerman and Risemberg, 1997) is another

important linkage for success. Self-management secondary determinants include health

and well-being of the student, self-determination and self-control. This section of the

literature review will look at these determinants through the lens of family, community,

school and the individual.

Family

A healthy family climate can promote greater task engagement and self-regulation

in children (Schickedanz, 1995) and buffer the negative effects of poverty on children's

academic achievement and confidence in their ability to secure a satisfying career

(Entwisle & Alexander, 2000; Taylor, 2000). Parents are believed to establish

orientations toward the school setting through a history defined by their culture, social

class, and childhood school experiences (Taylor, et al., 2004). This history influences the

child's school experiences and can create a positive or negative orientation towards school. The past and the present merge to shape parents' ongoing orientations toward school, which influence how they interact with their children concerning school matters, what they tell them, and ultimately the orientations that children adopt toward school and their school performance (Gonida, et al., in press; 2004). These findings support a trend on the conceptual side of the academic achievement literature toward establishing socialization models (Seginer, 2006; 2004; Weiss, et al., 2003) derived from ecological theory applied to the family setting (Bronfenbrenner, 1986; Bronfenbrenner & Crouter, 1982). The family is conceived as a microsystem that has a strong influence on children, is influenced by other microsystems like work and family, and is embedded within an ecosystem (i.e., community) that shapes the contexts therein. A second critical component of self-management is found within the environment of the school that the student attends.

Approach to School and Culture

The occupational and academic socialization models converge around the notion of capital. Presumably financial, human, and social capitals are passed from parents to children through socialization experiences that contribute to observed intergenerational stability in SES (Coleman, 1987, 1988). Research at the intersection of capital, race, and culture generally yields a picture of the most impoverished adolescents from racial minorities facing almost insurmountable challenges precluding academic and work success (Wilson, 1996). Although adolescents who lack resources and who are from a minority culture appear to have aspirations that are as (Cook, et al., 1996) or even more (Csikszentmihalyi & Schneider, 2000) optimistic than their wealthier Caucasian

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counterparts, they tend to (a) report fewer opportunities to learn and engage in vocationally relevant skills and behaviors (Csikszentmihalyi & Schneider, 2000), (b) disproportionately aspire to rare and exceedingly challenging occupations, like athlete and lawyer (Csikszentmihalyi & Schneider, 2000), (c) hold onto those aspirations through an older age (Cook, et al., 1996), and as discussed above, exhibit large differences in rates of graduation and employment. Many of these differences can be reasonably attributed to a lack of human, social, and financial capital to support the training and education necessary to place children living in poverty in a position where they have a reasonable chance to compete for the occupations they desire (Wilson, 1996). In addition to the capital factors stated, ones well-being is also a critical component of self-management

Well-being

Theory and research suggests that academic achievement hinges on motivation, confidence, engagement, prior achievement, and healthy living; these are the foundational components for student success and career advancement. The association between motivation and achievement is well established and based on a comprehensive literature review spanning two decades, the CDC (2010) found that healthy living (e.g., increased physical fitness and improved diet) is associated with substantial gains in students' academic achievement and academic motivation.

In terms of motivation, Wigfield (1992) organized several of the most commonly used motivation constructs and structural links between them around three general questions to include (a) "Can I do this task?" that yields answers pertaining to self-evaluative beliefs (i.e., competence beliefs), (b) "Do I want to do this task and why?" that

translates into appraisals of value and worth (i.e., subjective task values, goal orientations, and interests) and (c) "What do I have to do to succeed on this task?" that reveals how plans are formulated and enacted. At the heart of the association between motivation and achievement is the assertion that children who believe they can achieve a goal are motivated to engage in behaviors leading to that goal, are more likely to behave with greater goal-oriented effort and persistence, and are ultimately more effective in achieving the goal. Empirical research suggests that each of the three motivational elements must be considered when employing motivation to predict achievement.

Self-management hinges on a healthy family climate promotes greater task engagement and self-regulation in children (Schickedanz, 1995) and buffers the negative effects of poverty on children's academic achievement and confidence in their ability to secure a satisfying career (Entwisle & Alexander, 2000; Taylor, 2000). Parents are believed to establish orientations toward the school setting through a history defined by their culture, social class, and childhood school experiences (Taylor, et al., 2004). This history interacts with the school experiences parents have with and through their children. The past and the present presumably merge to shape parents' ongoing orientations toward school, which influence how they interact with their children concerning school matters, what they tell them, and ultimately the orientations that children adopt toward school and their school performance (Gonida, et al., in press; 2004). Findings like these support a trend on the conceptual side of the academic achievement literature toward establishing socialization models (Seginer, 2006; 2004; Weiss, et al., 2003) derived from ecological theory applied to the family setting (Bronfenbrenner, 1986; Bronfenbrenner & Crouter, 1982). The family is conceived as a microsystem that has a strong influence on children,

is influenced by other microsystems like work and family, and is embedded within an eco-system (i.e., community) that shapes the contexts therein. A major component of well-being includes the various components that make up healthy behaviors and self-control.

Healthy Behaviors – Sleep, Diet, and Exercise

School performance can be influenced by health-related factors such as hunger, physical and emotional abuse, and chronic illness (Dunkle and Nash, 1991). Grade fluctuation and poor test scores are correlated with behaviors such as early sexual initiation, violence, and physical inactivity (Carlson et al 2008, Srabstein 2008). Academic success is an excellent indicator for the overall well-being of youth, including a healthy diet, exercise and enough sleep (National Center for Health Statistics, 2011; Vernez et al 1999)

Health and well-being within the educational environment for all students has been a concern and point of focus for a number of national education organizations; it has been recognized that there is a close relationship between health and education and that this connection must be fostered (National School Boards Association, 2009; American Association of School Administrators, 2007). Research documents that intervention programs and supporting healthy lifestyles in children can impact their academic achievement (Basch, 2008).

The CDC now analyzes research findings to develop guidelines and strategies to help schools build programs and guidelines that will improve student diet, exercise and sleep patterns (CDC, 2010). Schools play a critical role in recognizing and promoting

healthy behaviors among young people and this effort has a positive effect on academic performance (Basch, 2008).

Self-management is composed of family, health factors, self-control and socialization. Understanding how environments condition students to behave before they enter school is critical to helping them undo unhealthy patterns or build on positive assets that they bring to the table. Knowing how to negotiate individual success is dependent on knowing how to manage one's self n any given situation and to balance this with the emotional, academic and physical development that are all interacting to influence development and success.

If the non-academic factors (motivation, social engagement, and self-management) are properly aligned for the student then the student will be able to reach his or her academic potential. These non-academic factors will be refereed to throughout the research as primary determinants of academic success. The research has also clearly pointed out the secondary determinants that make up the primary foci. See table 9 for a list of determinants in each structures. Lastly, the literature has also helped naturally develop a taxonomy for understanding these determinants, specifically, as matters related to family, community, school and the individual.

Table 9 Secondary determinants

Primary Determinants	Motivation	Self-Management	Social Engagement
Secondary Determinants	Goal Orientation Consciousness Self Confidence	Self-Control Physical Well-Being Self-Determination	Social Connectedness Social Activity Teamwork

Academic Achievement

Research spanning the past century has contributed to a general theoretical model of the student and family characteristics associated with student success. Contemporary robust reviews of the literature suggest, however, that most theory and research is limited to demonstrating the role of a small number of malleable student (e.g., motivation and interests) and durable contextual (e.g., family socioeconomic status) characteristics that predict students' academic achievement (Battle & Lewis, 2002; Wigfield & Cambria, 2010). Moreover, this research is most often limited to employing cross-sectional data to make inferences about longitudinal change, which is a practice fought with methodological limitations. Additionally, silos of research have begun to explore associations between fundamental aspects of adolescent development like the link between academic success and career development and more robust efforts have examined the dynamic links between well-being, healthy behaviors and student success. This section of the research will look directly as pure components needed for learning and academic achievement. Table 10 below outlines the critical concepts explored in this section.

Table 10 Critical Concepts Explored within the Area of Academic Achievement

Factors	Academic	Critical concepts explored (Major Author)
Academic Achievement	Academic	• How People Learn (Bransford) • 21st Century Learning Skills (Wagner) • Internships and specialized programs (Bridglall and Gordon) • Career plan (Tinto)

How People Learn (HPL)

  In the traditional model of education, "teaching is telling, knowledge is facts, and learning is recall" (Cohen, 1989). We know now that learning is about understanding information within a general framework and being able to relate and apply general concepts to specific experiences across contexts. How People Learn 2000 embraces active learning as an outgrowth of behaviorism that places active learning in the service of metacognition rather than just the mastery of immediate skills (Bransford, 2000, 12-13).   Any assessment or learning measurement must in some sense be behavioral as well, since the teacher must explore the student's state of mind through the student's behavior. This is especially true when understanding how to best increase content-knowledge and application of engineering principles in an innovative manner to teachers so they can transfer this knowledge to the classroom.

  Integration of Bransford's model provides a backdrop for problem based learning. By providing these transferable lessons and methods to teachers, and working with them in the classroom for application it increases the likelihood of students' ultimately achieving standards of proficiency by a) intensifying their engagement in learning activities, thus reinforcing what they have learned, b) motivating them to strive for learning at higher levels, c) providing multiple strategies for learning expression, and d) creating opportunities for them to learn new material or skills more rapidly and with increased confidence. The How People Learn framework uses and supports academic achievement for all types of learners and those in various stages. Teaching and learning

needs to be learner-centered and take into account the strengths and skills of the learner (Bransford, 2000).

Academic experience (rigor and skills) and high school curriculum affect almost every dimension of success in postsecondary education. Students who are best prepared coming out of high school have completed work that reflects the understanding and application of their learning experience (Gladieux and Swail 1998, Horn and Kojaku 2001; Martinez and Klopott 2003; Warburton, Bugarin, and Nunez 2001). Eighty-seven percent of students who complete four years of math, science, and English in high school graduate from college at higher rate than their peers (62 percent persistence rate of those that do not complete that coursework) (Adelman, 1999; Warburton, Bugarin, and Nuñez, 2001). Research indicates that the single best high school predictor of performing well academically in college is the completion of high-level mathematics classes in high school—algebra II, pre-calculus, trigonometry, calculus (Adelman, 1999, 2006). Socioeconomic status was less predictive of academic achievement as compared to neighborhood socioeconomic status factors (Wenglinsky, 1998). A third strong predictor of academic success is parents' and peers' influence on student persistence decisions (Bank, Slavings, and Biddle, 1990).

Research also indicates that enrollment in postsecondary programs improve access for students from low- and moderate-income families, as well as first-generation students (Tierney, Corwin, and Colyar, 2005). Another precollege supplemental education piece is the formal and informal learning opportunities that occur within and outside the regular school day via internships and specialized programs (Bridglall and Gordon, 2002). Characteristics and experiences from high school shape expectations and

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goals to varying degrees. Olsen et al. (1998) found students who were engaged in multiple enrichment activities and programs in high school were more likely to be academically successful later. Students achieve higher rates of success and are able to begin to internalize the metacognition process when provided with timely and regular feedback (Kulik, Kulik, and Cohen, 1980; Menges and Mathis, 1988).

STEM education is defined as a meta-discipline - the integration of multiple disciplinary fields built into a new framework aimed at maximum success from each academic discipline. Integrated STEM education offers students a platform to establish a more holistic sense of the world. The interdisciplinary nature of STEM education seeks to remove the barriers raised by discipline-centric learning and naturally integrates many of the learning components into a cohesive teaching and knowledge paradigm. Math problems, for example, may be more readily understood and solved by providing an example from the discipline of engineering or science to illustrate how the math concept is used in the real world. This approach is also shown to engage girls in STEM disciplines because of the real-world connection and the collaborative nature of the problem solving.

Research on career interests suggests that girls may exclude STEM career pathways or migrate away from these pathways because they struggle to find a social or human relevance. A significant fraction of boys share similar socially-motivated career interests. Research on gender-role attitudes found that girls hold more negative attitudes toward math and both sexes hold gender stereotypes with math being associated with males.

Problem/Project Based Learning (PBL)

Widespread reform of education, such as using problem-based learning (PBL), can help "high--poverty schools…with persistent achievement gaps" reduce these gaps. As MC Squared looks to meet the needs of diverse and under-represented students from high-poverty communities, the strategy has used 21st century tools of innovation and redefined collaboration to knit prior knowledge to experience, building greater academic interest via integrating theory manifested in problem based learning. The interdisciplinary nature of STEM education seeks to remove the barriers raised by discipline-centric learning and naturally integrates many of the learning components into a cohesive teaching and knowledge paradigm. Math problems, for example, may be more readily understood and solved by providing an example from the discipline of engineering or science to illustrate how the math concept is used in the real world. This approach is also shown to engage girls in STEM disciplines because of the real-world connection and the collaborative nature of the problem solving. This is Problem Based learning (Palumbo, 1990).

Cognitive research has guided researchers and teachers to adopt a different model of problem solving. This research has shown that problem solving includes a complex set of cognitive, behavioral, and attitudinal components. The PBL curriculum and pedagogy framework used at MC Squared STEM was based on the following principles: 1) the student is the central player, 2) problems form the basis of all teaching materials, and 3) learning occurs in group discussions, inquiry-based problem solving, and integration of content knowledge. This approach converts students from traditional passive learners to active seekers and developers of knowledge and skills. PBL creates an avenue for communication and speaking skills, builds organization and time management skills, and

allows for a kinesthetic experience in research and inquiry skills, self-assessment and

reflection skills all critical to the blending and instructive process. (Ravitz et al, 2011).

HPL and PBL

Co-creating the learning process, as an interaction between students and teachers

in a problem-based environment, requires a strong foundation like that offered by

Bransford's learning theory (How People Learn). In the traditional model of education,

"teaching is telling, knowledge is facts, and learning is recall." Students as educational

leaders must make effective use of existing knowledge, leverage contextual opportunities

and engage in self-evaluation to eventually master specific content in a meaningful way.

When the learning context expects self-led learning, the learner comes to view peer and

teacher collaboration as a support to master skills and practice critical thinking and

problem solving as a communal effort. Bransford's model (embedded at MC Squared

STEM) provides a backdrop for the PBL approach. By providing these transferable

lessons and methods and helping students gain a new "habit of mind," we expect that

students will achieve greater levels of STEM proficiency. The "How People Learn"

framework promotes a pedagogical approach of PBL to expand learning opportunities for

all types of learners in all stages of their scholarship and it opens the door to create a

"habit of mind" for students to eventually generalize to all of their learning (Bransford,

2000).

The combination of traditional learning and a PBL approach captures each

method's greatest assets for developing our students, while providing a motivational

component of STEM and self-study. This learning model pays respect to the

understanding that motivation and attitudinal aspects such as effort, confidence, anxiety,

persistence and knowledge about self are important to the problem solving process. It is also sensitive to the need to ease students through the transition from didactic to self-led learning. The evidence suggests that utilizing the strengths of both models deepens learning, increase motivation, and increase the cohesion of social relationships within the learning community. The relationships and work in capstones at MC Squared STEM is the foundational change agent for collaborative partnerships, innovative learning and optimization of existing assets for greater reach and deeper learning.

Chapter Summary

There are four key components identified by researchers on what helps students reach their academic potential within their learning community: academic achievement, motivation, social engagement, and self-management. The focus of this research is how the three non-academic factors of motivation, social engagement, and self-management have influenced the MC Squared students' ability to maximize academic potential. Chapter 3 addresses the methodology of this study.

CHAPTER 3: METHODOLOGY

Introduction

The objective of this chapter is to present the methods and procedures that were utilized to collect and analyze relevant data associated with this study. More specifically, this chapter provides (1) an overview of the research methodology used for this study and (2) the studies research design, which discusses the (a) study population, (b) respondents, (c) survey instrument, (d) data collection process, and (e) data analysis process utilized for the study. The data collected by the methodology described in this chapter was used to understand the impact of the schooling experience for each of the six students scrutinized. This information was examined for collective observations or patterns that provided insight into why students at MC Squared STEM have experienced high levels of academic success.

The Research Question

By standard academic measures, students at MC Squared are outperforming their peers in other schools. At the same time, the culture and curriculum of the school support the non-academic as well as academic development of the students.   Thus the primary question for this study is:

How and in what ways do the non-academic factors of the MC Squared STEM experience contribute to students' academic success?

The question will be addressed and framed by three non-academic determinants for student success: Motivation, Social-Engagement, Self-Management.

Research Methodology

MC Squared is a project-based STEM school intent on preparing students for college and successful careers in STEM fields. Students are engaged in a dynamic, rigorous curriculum in a project-based learning environment that provides them with critical skills for the 21st century global economy. The school graduated its first class in June 2012.

A qualitative research design was used for exploring students' perceptions about what factors influenced students to be successful in their experience at MC Squared. Cohen & Manion (1994) indicate that in methodological terms a qualitative research approach emphasizes the realistic nature of the social world. Cohen, Manion and Morrison (2000) define method as "the range of approaches used in educational research to gather data which are to be used as a basis for inference and interpretation, for explanation and prediction" (p. 44). They state that it is a process as opposed to pure outcomes. Following Cohen & Manion (1994), this study will use a qualitative design format because the natural setting is the direct source of the data (Fraenkel & Wallen, 2003). The focus of this work is to find out students' perceptions, the effect of those perceptions on their success, and the reasons behind their perceptions (Creswell, 1994).

The methodology for each of these objectives will be discussed in this section. According to theorists such as Yin (1994), group and individual interviews address a wide variety of data, allowing the researcher to speak to a broad range of historical, attitudinal, and behavioral issues (Merriam, 2002). Yin (1994) notes value in this method, as multiple sources of data may be used to develop a line of inquiry that culminates with the convergence of data from a variety of sources. As a result of using this method,

findings or conclusions generated from this work are likely to be more convincing and accurate because they are based on several different sources of information following a corroboratory mode (Yin, 1994).

John Creswell, in his 1994 book *Research Design: Qualitative and Quantitative Approaches*, pointed out five reasons for combining methods: (1) the convergence of results; (2) the ability to identify overlapping and varying facets associated with data collected from two different sources; (3) the sequential use of the qualitative approach to develop the quantitative approach; (4) the ability to examine contradictions and fresh perspectives from the data collected; and (5) the ability to add breadth and scope to a study.

<div align="center">Case Study</div>

Case studies utilize inductive reasoning since new understandings, concepts, and relationships arise from studying the data (Merriam, 1988). Yin (1994) notes that a case study relies on multiple sources of data collection, triangulation of data, and benefits from prior development of a theoretical framework which guides data collection and analysis. This case study will focus on the perceptions and practices of six students in the secondary school. Yin (1994) stresses that a case study should occur "within its real-life context" (p. 13) and this was an important emphasis in this study, because the study will look at factors which affect their learning and success via the student's own context. This study is an Explanatory Case Study. This type of case study is used when one is seeking to answer a question that sought to explain the presumed causal links in real-life interventions that are too complex for the survey or experimental strategies. In evaluation

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language, the explanations would link program implementation with program effects (Yin, 2003). This type of case study is used to explore those situations in which the intervention being evaluated has no clear, single set of outcomes (Yin, 2003).

The unit of analysis in this case study is the school, and we will use the feedback from the students and evidence from the school to understand how the school has impacted the students.

Patterns that describe relationships between the student and their experiences in the school (formal and informal) will be a focus of this research. This approach can adapt and use a mixed methods technique in a research study. Typically case studies consist of multiple techniques for data collection (Cresswell 1998). This evaluation is all crafted within the context of MC Squared.

Research Design

Study Population

MC Squared is part of the Cleveland Metropolitan School District (CMSD), Ohio's second largest school district. Its approximately 41,000 students are 70% Black, 15% white, 11% Hispanic, and 3% other. 83% of the student body is at poverty level and 100% are eligible for the federal universal meals program. The district serves 2,000 homeless students. Multilingual services are offered in 30 languages and 4,623 students speak a language other than English. A mobility rate of 38.2% of students transferring in or out of school in the course of a year creates instability and discontinuity. 21% of students qualify for special education services versus the national average of 12%. The graduation rate has declined from 60% in 2006/07 to 53.7% in 2007/08. The average

ACT test score in 2008 was a 16, well below the 20 level for workforce readiness and 21 for college readiness.

Study Participants

The population for this study consisted of individuals who participated in the MC Squared High School experience during the academic years of 2008-2012. As of April 2012 the following facts described the school enrollment:

- 235 students enrolled in MC Squared

- 100% of students qualified for free lunches

- 185 students lived in the City of Cleveland; 50 lived in surrounding suburbs

- All students with disabilities were mainstreamed.

See Table 11 Enrollment of MC Squared.

Table 11: Enrollment for MC Squared STEM High School (As of April 18, 2012)

Category	Count	Percentage
Total Students	235	100.00%
Total Male	146	62.13%
Total Female	111	47.23%
African-American	190	80.85%
Caucasian	34	14.47%
Hispanic	26	11.06%
Asian	1	0.43%
Students with Disabilities	22	9.36%

Participants in this study come from the greater Cleveland area and have been identified as individuals who fully experienced the culture and impact of attending MC Squared. To participate in the case study, students will have to complete a consent form, be eighteen years of age or older and be willing to participate in at least one group interviews, an in-depth interview and submit artifacts from their school experience for review. This study will have an equal gender distribution. The students will be selected based on meeting elements of three criteria: Post-Secondary Enrollment Options Program (PSEOP), internships, and general completion of high-school requirements (see Table 12)

Table 12: Distribution of Requirements for Participation

Student Achievement	Grades	Internships	PESOP
Group Yellow	X	X	X
Group Green	X	X	
Group Blue	X		

Participants chosen for the study met pre-determined categories that represent a spectrum of learning and student outcomes.

This research study is based on the notion that it is vital to work with research participants in close association in order to find out their perceptions, ideas, and beliefs (Yin, 1994). Keeping in view the nature of the research question exploring the students' perceptions and effect of their perceptions on their learning/success a qualitative research paradigm was implemented. The advantage of a qualitative research design is that it is flexible; therefore as the researcher, it allows for modification to the research design during the study if needed (Merriam, 1998).

Data Collection

Student Survey

Surveys were administered in order to learn about the distribution of

characteristics, attitudes or beliefs of a population (Marshall and Rossman 2006). A

survey of the 2012 senior class of MC Squared STEM High School was the initial data

collected in this study. There are 59 seniors in the class of 2012 and each was provided

an open-ended list of survey questions (Appendix B). The data collected from this

survey was analyzed for patterns of responses. Patterns found served as reference points

from which to focus specific attention during the intense study of six specific senior

students from the MC Squared class of 2012 (Marshall and Rossman 2006).

Group Interviews

One method of data collection selected was the group interview approach. A

group interview is appropriate when a) creative group thinking is desired; b) when facing

complex problems; c) when a new perspective on differing proposals for resolving a

problem is needed; d) when clarification is needed; e) when ideas, perceptions, and

assessments are needed quickly; and f) when it is difficult to obtain needed information in

writing (Richard, A. 1988; McKillip 1987, and Marshal 2006). This approach is

advantageous because it provides social orientation and allows for a more relaxed

exchange between participants (Marshal 2006). Limitations of this model include the

presence of power dynamics in the group interview setting and the potential loss of time

control (Marshal 2006).

The group interview was designed to be led by a facilitator who is knowledgeable

about the topic being addressed and skilled in asking questions and probing for

information without biasing the answers (Richards, 1988). A lead facilitator and an assistant interviewer who has the same knowledge and skills as the interviewer and who serves as a recorder and helper facilitated these group interviews. The sessions were two hours in length, with participants encouraged to actively and creatively express their views in response to the questions asked. Each group interview was set up to include representation from the three established student categories described above. The sessions were tape recorded as an aid to data analysis and more in-depth understanding. Interaction among participants was encouraged throughout the interview sessions.

Questions were developed to elicit responses within each of the identified domains.   Questions were arranged in logical sequence, beginning with more general open ended questions. These encouraged the widest possible range of responses from the student participants and served the task of getting students comfortable with the process and each other. As the group interview progressed, questions became more complex. (Patton 1990 Schatzman & Strauss 1973).

Individual Interviews

A second method of data collection selected was the Individual Interview approach.   Used in conjunction with the analysis of artifacts and group interviews, the individual interview provided a broad span of knowledge about the subjects and helped to aggregate the perceptions or knowledge over multiple respondents (Stake, 1995). According to Marshall and Rossman (2006), Kahn and Cannell (1957) describe interviewing as "a conversation with a purpose". The individual interview is a primary component of a phenomenological study and is frequently one form of data collection in Case Study Methodology (Cresswell 1998). The purpose of interviews is to describe the

perceptions of a small number of individuals who have experiences in a given phenomenon. This method is based on the assumption that participants' perceptions should unfold as the participants view it (the emic perspective) not as the researcher views it (the etic perspective) (Marshall & Rossman 2006).

Interviewing is a technique that is primarily used to gain an understanding of the underlying reasons and motivations for people's attitudes, preferences or behavior. The personal interview has multiple positive aspects that include: a serious approach by respondent resulting in accurate information, in-depth questions that can be discussed, ability to investigate motives and feelings, use of recording equipment, and revealing characteristics of respondent being assessed – tone of voice, facial expression, hesitation, etc. – during the process (Creswell, 1998). The limitations of this approach may include: respondent bias (tendency to please or impress), the opportunity to create a false personal image or end the interview quickly, embarrassment possible from personal questions, and transcription and analysis can present problems – subjectivity (Creswell, 1998).

A series of individual interviews were conducted. Each session consisted of a set of predetermined questions (see Appendix C) and each interview lasted two hours. Questions were arranged in logical sequence, beginning with general open-ended questions.   These general questions encouraged the widest possible range of responses from the student participants and served the task of getting students comfortable with the process. As the interview progressed questions became progressively harder and more closed-ended (Patton 1990 Schatzman & Strauss 1973).

Students were given the opportunity to break, ask their own questions or stop the process at any time. The interview was structured by focusing questions within one of the

three domains of the study but allowed the respondent to express him or herself at length. The researcher began by asking a general question in an effort to create a comfortable atmosphere. The researcher then encouraged the respondent to talk freely. The researcher used an unstructured format; the subsequent direction of the interview was determined by the respondent's initial reply. The interviewer probed for elaboration, using such follow-up questions as "Why do you say that?" or, "That's interesting, tell me more" or "Would you like to add anything else?" As part of the process, to make the interviewees more at ease with the interviewer, the interviewer had lunch with the interviewee prior to the interview.

Data Analysis

To best achieve the objectives of this study another critical methodological approach was used consisting of qualitative and quantitative methods—an approach that is most frequently encountered in literature as triangulation (Brannen, 1992; Brewer & Hunter, 1989; Neuman, 2003). The notion of triangulation is drawn from the idea of "multiple operationism" which suggests that the validity of findings and the degree of confidence in them will be enhanced by the use of more than one approach to data collection (Brannen, 1992). According to Neuman (2003), by measuring an outcome in more than one way, the researcher is more likely to see all aspects of it. The data will be triangulated by collecting group and individual interviews, surveys, grades, test scores and writings/work products of the students from over time.

"Data analysis consists of examining, categorizing, tabulating, or otherwise recombining the evidence to address the initial propositions of a study" (Yin, 1994 p, 10). Every investigation should have a general analytic strategy, so as to guide the decision

regarding what will be analyzed and for what reason (Yin, 1994).In his work Yin suggests some possible analytic techniques: *pattern-matching*, *explanation-building*, and *time-series analysis*. This evaluation used all three of these techniques in the process of content analysis. Content analysis (Titscher et al., 2000) is "the longest established method of text analysis among the set of empirical methods of social investigation" (p.55). Babbie (2001) defines content analysis as "the study of recorded human communications" (p.304). Bryman emphasizes the role of the investigator in the construction of the meaning of and in texts as a critical component of content analysis. Interpreting the data means developing an understanding that is grounded in the data, within and across experiences, events, times, actions, and activities that constitute the social situations of the everyday life of the students who are being interviewed. Material, activity, and/or social dimensions of the students and the school were examined as part of this study. The analytic principles of practice that were used include comparing and contrasting data, methods, theories, and perspectives; examining part-whole relationships between and among actions, events, and actors; seeking insider understandings of experiences, actions, practices, and events; and identifying through these what is relevant to the local group (Babbie, 2001).

Collected data was analyzed in four levels: participants' information, interpretations, what findings mean and the value of findings to users, and judgments about the value of the findings. The following process was followed when analyzing data at these four levels:

- List key words and phrases until all important ideas are noted from all reports. Ideas were not repeated, but were noted as recurring.

- Selective coding (using primary and secondary determinants derived from the literature review) was utilized in order to sort responses.

- Identify themes or topics that seem to recur. List these.

- Put one theme at the top of each sheet of paper and list the data under the corresponding theme (motivation, self-management, social engagement and academic achievement).

- Analyze each theme. Aggregate or lump related items so there are fewer categories within each theme (some themes may be merged).

- Identify problems or gaps in data and plan ways to add needed information or to clarify unknowns.

- Identify new concepts or ideas.

- Interpret findings in relation to study objectives (motivation, self-management, social engagement and academic achievement).

When possible interview data was manually transcribed into a data-tracking chart designed to collect the responses to the interview questions developed for the study. To ensure that the information collected from the interviews was accurate. Once the researcher is able to verify that the information documented on the data-tracking charts the researcher will utilize content analysis to analyze the data collected. Content analysis provides the researcher with a research tool that quantifies the presence, meanings, and relationships of words within texts or sets of texts, so that inferences could be made regarding the messages within the text (Krippendorff, 1980; North, Holsti, Zaninovich, & Zinnes, 1963; Weber, 1990).

Chapter Summary

The qualitative and quantitative approaches employed in this case study will be used to assess the students' perceptions of their school experiences. The use of a mixed qualitative and quantitative approach provides the researcher the ability to identify overlapping and varying facets associated with the data collected from several different sources while adding breadth and scope to the study. The qualitative phase of the study was designed to aid the researcher in assessing the students' perceptions of themselves and their school.

CHAPTER 4: STUDENT VIGNETTES

Introduction

Using interview data, this chapter provides an in-depth look at the key life events of each student in the study as told through a vignette. The vignettes trace the students' progression through MC Squared and highlight some of the critical variables that led to their achievements. In this way the vignettes function as micro-narratives as the students explain the reasons for their success (Savikis, 2008). Each vignette is accompanied by quotes from their interviews.

If there were only one truth, you couldn't paint a hundred canvases on the same theme.--
Pablo Picasso, 1966 Picasso, P. (1966). Quoted in Hélène Parmelin, "Truth," In *Picasso Says.* London: Allen & Unwin (trans. 1969).

Our memories and experiences shape our behavior and our responses to the world. When things go well we behave (consciously and unconsciously) in ways that reinforce those experiences. When things turn out poorly, we struggle to conquer those behaviors, and often we repeat the same experience in different ways, hoping eventually to master it. Garrett comes from a background that is similar to that of his peers. His father was not engaged (a few rare visits over his lifetime), and his mother had to attend to him as well as to multiple other siblings with a similar paternal experience. Surviving poverty and growing up in an unforgiving, depleted environment delays children in their cognitive and emotional development. When this occurs in successive

> *I don't know what's wrong with that guy. He wasn't really around a lot when I was younger. At first he wasn't claiming me but in case I needed an organ or anything she made him get a , you know, he's definitely your son. At that point, he was around for a few months you know trying to be there. He just kind of fell off of the face of the earth for a while. He just wasn't the ideal father, not that he was a horrible guy or anything, he just wasn't the ideal dad. Still to this day he's not the ideal dad.*
>
> *9th grade I had my freedom to choose which way I wanted to go. I could have been the cool kid or the smart kid or the kid who gets into trouble.*

generations, the impact is multiplied, and whole family histories are written with very low rates of success.

Garrett was lucky. He found a way out early, a pathway that allowed him to build a foundation for each tomorrow he faced in his world. Garrett's early years were spent fighting off an illness that hospitalized him repeatedly, and provided many hours alone to learn from his surroundings. Because of his condition, the district provided for him a smaller school that could address the special needs of a child with his health. It was during this time that he found his direction, and along with it motivations and social connections. He began to understand how the world outside his home operated and appreciated the vast differences between each of these places. He moved his reference point of impoverished expectations to an imbued view of the means to make it out of the abyss, finding ways to succeed without destroying himself or the people around him.

College didn't come up in my house. It was if you did not finish high school you were going to the service, that type of thing. And so education was never that highly stressed. My mom dropped out of high school and got her GED. My grandma, I'm not even sure if she finished high school. And so those type of things just never came up. But I can tell you one thing going college is the best way to start. And so coming to MC Squared and me and Marcel were just talking about this, the first thing I said I'm going to an Ivy League School and major in human genetics. And that's when they said, where do you do you want to go to school or what do you want to do, I said I AM going to an Ivy League College.

Garrett knew when he entered MC Squared that he wanted to go to the best college possible. However, he had never spent any extended time in school. His absenteeism was a part of who he was and something he would have to conquer to succeed in his new environment. Garrett spent his first year learning how to be a team player. He discovered a way to use his intellectual capital to build community around him and strengthen him, as opposed to walling himself off from the world and all of the dysfunction that came with it.

Garrett's interactions within the provided social networks helped him to appreciate himself and his potential in an honest manner. It relieved him from the adult responsibilities that were placed on him at an early age. While he was at MC Squared he was able to cultivate very special relationships with the

Over the years I actually got to the point where I wasn't saying I was going to an Ivy League school anymore but I guess I had that kind of mindset. It was always in the back of my mind where I was going. So, I'm not studying human genetics of course now but that was one of the things that, since I started at MC Squared STEM, it's been, everybody's going to college, everybody's doing something. And just to have that mindset, even if everybody doesn't, just to be in that environment where everybody's telling you that, unless you know that you can't. It was like that confidence booster and for us to be able to accomplish the things that we have, our so many people and being able to present to all those people, be confident in the information that I was giving out it made me feel really good about myself and made a lot of kids feel really good about themselves. And everybody was believers. Everybody that was there believed in each and every one of the students. And so to know that we could produce that kind of community definitely made us, all of us, feel like we had a chance or a shot, even people who probably weren't even thinking about going to college before they came here.

school staff; this provided an operational model of a healthy family for him. The security he felt coupled with the support he received allowed him to learn freely and become healthy physically. The ability to manage his own mind and body with the knowledge of the invisible safety net around gave him the bounce he needed to achieve the very highest accomplishments in high school.

During the course of his tenure at MC Squared Garrett was displaced from his home, and fought difficult battles with his mother to become free of the unhealthy environment that often surrounded him. He was able to learn from role models (male and female) from various classes and cultures how to break free of the barriers before him.

Garrett also learned how to conduct himself in a manner that provided positive feedback and let him bypass the pain of the family drama that routinely threatened to knock him off track. Garrett's greatest struggle was also his greatest strength: his creativity and street smarts. This combination led him to make bad choices from time to time, but also made him a tremendous reader of social cognition. Understanding how to talk to people and appreciate their individual assets enabled Garrett to make important social connections, connections that would give him the support he needed to develop into a successful college-bound student.

MAE

Mae grew up in the poverty of inner-city Cleveland as the oldest of multiple children. Like her siblings, she never got to know her father. She experienced many of the deprivations and hardships endemic to a life of poverty. In childhood Mae experienced the world as a shy girl who struggled to express herself. Her needs competed with those of her siblings in her underprivileged home. At school, her external story was the norm and she responded to this hard-hitting world by building jungle –like survival skills and an internal narrative to rise above and conquer. While having this inner guidance is critical to survival, fortitude and vision alone cannot build a whole person. We are social beings and have a need to be connected, engaged and accepted. Mae intuitively understood this, and when she found her way to MC Squared, she found a place that let her learn what a family that has ~ can do. She redefined herself in the safety of her new home.

> *My world was full of drama. I'm just going to be honest because – like being at home and elementary school was always drama, always drama. There was not a day when somebody said something about somebody was smart or somebody failed.*
>
> *Some kids in high school never grow a connection with their teachers. Sometime they hate their teachers, sometimes they don't want anything to do with their teachers. With me, they really cared about what you do, and they really want to see you succeed in what you want to do in life, and so the connection I have with them is outstanding cause I can got to them with anything, I can go to them just to talk, it doesn't have to always be about school.*
>
> *All I knew was that this school was MC Squared STEM and I applied and I just went. I went in with 2 other kids from elementary. So we were there. One of them is still with me.*

Mae came to school very independent for her world. She helped take care of her siblings at home; she got herself to places and committed herself to school. While she attended school and put forth effort, her test scores were below grade level and continued on that curve throughout her academic career. She had become used to surviving in school and getting by ~ no one pushed her to find the challenge. Her independence was a survival skill, and was limited to the context of her setting. Her knowledge of how to be in a relationship was circumscribed by the backgrounds of her immediate milieu. Her self-management was based on what it took to be safe in a place that was full of land-mines.

She had accepted certain things about her relationships with other people and was being confined to very limited options for her future.

At first I thought ok, how hard can it be to get just to get an A? And then when I actually started doing a paper or workbook or sustainability or stuff like that it became like, it's actually a good system, cause you – if you do real bad on a paper you can go and revise it. So you can get your mastery. So its kind a cool because who really can go back and reo their work? You have to do something else just to get your work. So we can actually go back, revise what we did wrong, and learn at the same time. We learn even more than we did before. So that's why I like it, especially working on research papers. You can actually go back and revise what you did, learn what you did wrong, and improve it.

So now I'm just out there. I'm outspoken, I love to talk, I to conversation – socialize – even give people advice. That's just what I'm about in my life. Before then you couldn't ask me for nothing . You couldn't ask me a question – I wouldn't answer. I was the type if you asked me a question I wouldn't say nothing.

A future most likely destine for the impoverished live that was all that she had known based on her lack of access to constructive social resources and therefore an inability to participate in a healthy social group (Family).

While she had the motivation and self-management skills necessary to succeed in life she lacked the social connections necessary to even know what success looked like. While very much an independent person, her independence was not guided by Mae's life experiences were lacking in the area of constructive Social Connectedness. Cohen and Syme (1985) define social connectedness as made up of two separate but integrated components. The first is social resources defined as the provision or exchange of resources for those who are in need of different types of support (e.g.., emotional, informational, or instrumental support). The second component is social participation, the belonging to and/or participation in one or more distinct groups, with interactions that are not explicitly designed to exchange help or

Yeah, like people tell me don't let it just be a high school thing, but with me, I want to be a nurse, I want to be a registered nurse. So I want to be a nurse and still have planning events on the side. Kind of like a hobby I do or something

You'll hear some people saying that at the other schools; yeah I got my group of friends, but I don't know if they can really – I don't know how to describe it, like. This school has taught me so much and changed me. I guess I changed. But I see it, I think about it every day. I have changed, and I never thought I was capable of doing anything like – I just thought I'd – I never really thought of anything, but this school made me think, really really think. It made me think that anything is possible because it is. And you can have help and you can get help. You can actually do these things. You can go to college and actually graduate and get a job and be successful. I'm just praying it happens, I'm praying so hard that it happens.

support. Participation and resource exchange in an equitable manner are critical for creating trust and shared values and experiences. MC Squared STEM High School provided her with the social web that helped her to redefine her reality. When she came to MC Squared STEM High School her reality (based on her life experiences and the first nine years of her formal schooling) had shaped who she was able to become.

Once Mae arrived at MC Squared STEM High School she realized that there was another way. She recognized that some define family and support differently than she had known. At MC Squared, she learned to become dependent. The opportunity was there to fail, fail and fail until she got it right, with the unconditional acceptance that redefined her internal definition of independence. She learned through "mastery" that she needed others to truly become independent. She found that the model of family and community that she had grown to accept were a shadow of what could be. At MC Squared she gained the opportunity to be accepted and appreciated based on her role in the class and her designation as a student that will succeed and will do so within the context of collaboration, team-work, pride, acceptance and hard-work.

RAUL

Thoreau notes in *Walden* that the most valuable endowment an individual can receive from his education is free: his peers. Intellectual curiosity, networking, and advancement are achieved by honing existing assets (social, cultural, and academic capital and a physical place and time) to transform our understanding, effectiveness, and practices of education.

Raul is a first generation American. His family came here to create a new life and to join a community that prizes education. Raul's story is in great measure defined by the experience of the preceding generations. His history paints a vivid picture of a young man's quest for success through life's stories, defined by a fierce desire to uphold his family code and values. His grandfather worked in the fields cultivating coffee beans for a living, his education not much beyond primary school. His grandfather lived in a community that valued hard work and measured a man's success

In Guatemala, the town we came from your expected life is you work in the field until you become an adult, and then you have children and those children work in the field always producing whatever crop, in our case it was coffee. Everybody had their coffee plantation and they would cultivate it until the end of their life. And most of those people weren't living in the best conditions. If the coffee didn't sell, they would live in poverty until the coffee would start selling again. So it was this on-off of success and not success. I guess my grandfather analyzed this and noticed that maybe education would be a more appropriate way to take life or to go by life.

However, I was pretty excited when they called my name. I also got to meet a bunch of prospective students and the primary part that interested me about the school were the STEM focus – science technology engineering and math – which were the only things I ever liked in school. Cause English and social studies weren't my favorites, but yes those aspects and the project based learning are primarily what called me the school.

by his dedication and achievement in working the coffee fields. Raul's grandfather, while

a very hard worker, believed that he was wedged into a commonplace life that did not

match his aspirations or ideals. He spent many hours educating himself and found a

distinct freedom from his life

circumstances through the world of

ideas and knowledge.

> *One time, the most memorable one, and the reason it's memorable is because it happened at the science center. We were making a robot and we had to make a gear train within the robot to move six legs and they all had to move simultaneously – well not simultaneously but in with the. So the robot shape was a box so I got to the point where I couldn't fit the gears into the space that I had in the box. I said oh I'm going to have to make the chassis again and I'm going to have to redo all the gears. It's a disaster. I went to Mr. McClellan and he said, think outside the box. And then it hit me. I could put the gears on the outside of the box and made the legs move that way. It was like, wow. Before I had like seen it, but that was an epiphany moment. It was a literal and kind of ironic situation.*

Raul's grandfather raised his

own children to work in the fields,

but he insisted that they continue

their education at the same time. His

sons, as was he, were ostracized for

this dedication to education. They

were pioneers in their community by

appreciating and reaching out of the

norm to become educated. His uncles

and father all completed their high

school degrees and continued on to

> *In a nutshell. Aside from the obvious – a ton of knowledge, a set of criteria, a set of values to carry over and good decision making skills*

college, all the while still helping in

the fields from time to time. People

asked Raul's grandfather why he did

not just send his young sons all the time to the fields ~ why did he send them away? He

created a family ethos ocean away that is echoed today by Raul's hard work, dedication

and a mantra of "I can do this and I will".

Because of his deep rooted family history, Raul knew what he wanted, and came to his education with a mission, a vengeance and a passion that most people never experience. While he had to navigate through several elementary schools, being moved because of his academic talents, his life was fairly stable and precise. His parents were highly engaged, and while navigating the American culture was a challenge at times for this first generation family, their inbred fortitude and hunger for making a new life framed much of Raul's life. His narrative was predefined and was being carried out with all the meticulousness and regiment that comes from an impassioned family with a dream. Raul experienced his first true curveball when he came to MC Squared. While Raul knew how to work hard and was trained to be conscientious (matching his naturally organized nature), his work had taught him only the knowledge side of learning. The missing piece was how to be a team player, how to innovate, how to marry that knowledge with creativity. Raul came to MC Squared with this test in front of him. While he may have learned next to others his whole life, it was just that: parallel play.

For example, I remember one test at PSEOP I sat there and the question seemed so easy. Well, it was an easy question but in my opinion it seemed like the hardest question I could have received. And I stared at it for like a good 20 minutes out of that one hour we had to do it and just said forget it I'm going to do the next four. I did those, I came back to it and continued to stare at it and said why is this so hard? And I would think about the most complicated solutions to the problem and then I just relaxed, inhaled and exhaled and knew it was just something simple. Even just the first week of common sense would have told me that -- out of the class -- that this is the way to do it but sometimes I get, go overboard with things. Sometimes it's good, sometimes it's bad. Generally I use it to my advantage but sometimes like that situation it really went against me.

The singular path to his own goals was clear, but the ability to interact with others to achieve goals was missing.

Learning strategies to work with others who are very different became at first a novelty, then a frustration. Raul was not used to being inter-disciplinary in his thinking, approach or style of learning. He was also not accustomed to having to depend on others to help him reach his goal. He was a very linear thinker and was always the first to pick out the patterns that shaped the work he was doing ~ but it was his peers that taught him how to shape himself and find the strength in the small treasures of being connected. Slowly he learned to look at a problem through a different lens, and in so doing find peace within the group. By participating in multiple group projects and not being able to depend on a set pattern, Raul learned a new type of adaptability that showed him more than just the front door, but the back door, the side door, and possibly a trap door to help him solve problems.

As a person I feel most of the time I'm called negative or I'm a pessimist. However I feel I'm an optimist. I don't hesitate when I see something wrong or premeditate a project. Cause in some projects we start off and I'd say this isn't going to work and they'd say why are you such a pessimist, you're so negative, it's going to work. Most of the time when I said something wasn't going to work, it wouldn't work. So I was often called a pessimist. And I feel – aside from that I kind of feel I have, I possess the ability to analyze something and determine all of its consequences. And I really like thinking through things before I act on them. I think for that reason I haven't gotten into trouble much. But sometimes I think that I over analyze things, which causes sometimes problems.

Raul developed more life mantras to define himself during his tenure at MC Squared. He learned to calm himself when things were not straightforward, and he taught himself that it was okay to not always be perfect. He benefited immensely from the spirit of a diverse community. He found his own voice, and is now ready to test that out in his world. His cross-cultural experiences, international internships, and daily life experiences in class expanded the world for Raul in a way that will allow him to be innovative, creative, and collaborative, while remaining true to himself and carrying the gift of his family's crest and expectations. Because of his deep rooted family history, Raul knew what he wanted, and came to his education with a mission, a vengeance and a passion that most people never experience.

> *They were familiar faces that I could go talk to more readily than people I had no idea of but yes the capstone was definitively an advantage to get to know everybody. And it was essentially living with them. I think they camped out at night. You got to see their habits and it's kind of like the soccer thing where you see how they lie f their messy, if their disorganized it can probably translate into their being a disorganized person. They think in a nonlinear fashion. Or they can be something like a neat freak so you understand that this person wants everything to be organized so they'll probably be great at organizing a project you're working on. Again it's another way of interacting*.

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a dream. Raul experienced his first true curveball when he came to MC Squared. While Raul knew how to work hard and was trained to be conscientious (matching his naturally organized nature), his work had taught him only the knowledge side of learning. The missing piece was how to be a team player, how to innovate, how to marry that knowledge with creativity. Raul came to MC Squared with this test in front of him. While he may have learned next to others his whole life, it was just that: parallel play. The singular path to his own goals was clear, but the ability to interact with others to achieve goals was missing.

RALPH

A culture of fear breeds a culture of anger. Growing up inside a culture of anger decays even the healthiest people. Once a child, a family or a generation has been raised in such a milieu, it is impossible to extinguish those experiences. Rather, one must gain traction from elements in that background to move in a more positive direction. Ralph is a kid who grew up with some intact traditional family supports, but lived in an environment where the norm was action and reaction of the self-destructive type. In this environment, the most basic individual interactions ~ the smallest indentations within that world ~ built adversity and created a secondary culture of ruinous harm.

Ralph moved through his world with ease, protected by an older brother, and learning how the slightest wrong could end up deadly. He was very smart ~ an uncultivated jewel. Early in his academic career, he was noticed and named. However, he struggled in the traditional school format; the pace was slow and his

My mom actually told me about the school. Once I heard about the summer time I thought oh man, I don't know if I want to go. I can't – it was just like I had just got out of school.

Challenges I faced. I went through a lot of challenges. The stuff that happened with me and my brother. That was a challenge and then I actually got accused of shooting somebody.

So I was sitting here and he follows me. And I'm thinking, he's doing an awful lot. The funny thing is that one of my brother's friends was actually friends with him and I saw them together and I told my brother's friend what he did. My brother's friend called me later that day and he was like he ain't going to go to court cause he knows he messed up from his lying because at the same time he said that I shot at him, my lawyer got the police report, the police tapes and stuff.

thinking was sharp, and the opportunity to move ahead never came to be. He used his

smarts to move ahead in other circles that were customary in his community~ he fell into

the chaos theory of what can happen when all the disadvantages of a community line up

just right.

Knowing how to break the cycle,

step outside, and use his internal

potential was a challenge that neither

Ralph nor his family could

overcome. The day to day values and

principles of his community made

his choices acceptable by default. He

continued with school but struggled

to manage his behavior, his

relationships and his motivation. His

innate ability helped him to convince

the people around him that his

actions were suitable, and

unwittingly they supported his

journey to hell.

> *But going to school during the summer it gives you some discipline because it's like if you can get the strength to go to school during the summer when you're used to going to school when you're used to being able to have during the summer if you get the strength to go to school during the summer then you know like okay if I can go to school during the summer than what makes you think that every day in the winter I can't do what I need to do or what makes you think that I'm going to skip – I haven't skipped a day here.*
>
> *Yeah, there's not really no point. It's like – I haven't skipped school here. My mom was laughing because she's like, how could you do it? We came to school on senior ditch day – national senior ditch day I was in school. It was crazy.*

While at MC Squared Ralph was the victim of a violent attack and during the

same incident lost a close relative. His outside life in the street was securing him as yet

another victim of violence and most of his early years at MC Squared were day to day,

questionable as to whether he would be able to stay. Ralph fought, he acted out ~ and his

identify narrative focused much on the external definition of who he should be and what he should look like based on where he lived and his community. Ralph came to MC Squared after missing the majority of his freshman year of high school. He came with the swagger and attitude of a giant while hiding behind a well-chosen disguise of armor.

After some time at MC squared ~ after the tragedy ~ Ralph started to see what a community of true support was, and began to find his way back to wanting to succeed, like the kid who was once recognized in grammar school. He learned to study, he found new social connections, he redefined his old connections at school and balanced his life with realizations that school was his way out. During his group interview he talked about finding himself driving all over town ~ after being up all night ~ to pick

I don't know where it's at. But it was fun. That was—master your own path – they should to do that for every year for all of the classes. Cause I know – if anything that will make them stay, that capstone will. Cause we had fun. Everybody had the same interest in the group. So people who I wasn't friends with it was like I became friends with because our interest in music. It was weird cause you saw people you didn't expect to see in there.

Yeah, and then the mastery is like if you missed one day it feels like you missed a lifetime because it's like they have a set lesson for that day so when you miss that day –so nothing – it's just like if I was a teacher and I know that a student skipped school, I would be like, why? Why do you think I should set back my plans for the day to help you?

up his friends and make them go to school. He himself was perplexed by his behavior, but as he talked, he grinned, and genuine warmth and caring came through. Eventually, he shrugged off the outside struggles, and defined himself again in the world of school,

but at a school that allowed him to be himself and a new culture that held high expectations for him.

Ralph fought himself all through high school, but he and his parents had a moment of realization that was a turning point for his success. After a serious confrontation with the principal about guns and actions, with his parents present, he slowly started to change his direction. Ralph spent many days invested in community ills that put him in harm's way, but his relationship to the school became like "home base" in a child's game of tag. The safety and structure of this home allowed him to reorient his goal, define how friendships and social connections should operate, view his community in a new light and make him realize he was responsible for making sure he became an independent young man.

And what so crazy was my health and wellness capstone that I picked was about violence and crime… And then while I was doing my capstone I wound up getting shot. It was like the crimes I was dealing with was youth crimes too. It was like youth and teen crimes against each other so it was just – it was weird. I actually got I an A on my health and wellness paper because it was like I included some stuff at the end that was mostly stuff that I had went through, stuff that I – and it was weird because it had to be 6 pages and I only got 2 pages up there and everything else just came from me, it was really weird. And I got an A on my paper

Wish I would have went here in 9th grade. Wish I would have known about this school. If I knew about this school before I knew about (the school that I went to in 9th grade).

Ralph's development is an example of the power of *school connectedness* (also called school bonding). School connectedness is defined as the degree of caring that students experience at school and the sense of closeness to school personnel and environment that

occurs (Resnick et al., 1997). Resnick (1997) states that school connectedness is an important variable in reducing risk for violent behavior. School connectedness is concurrently and prospectively associated with fewer internalizing and externalizing problems, including emotional distress, anxiety, depressive symptoms, substance use, general behavioral functioning, and violence (Shochet et al. 2006; Resnick et al. 1997).

Students who feel close to others, perceive themselves fairly treated, and are vested in school are less likely to engage in risky behaviors than those who do not (Resnick et al., 1997). Positive connections to teachers and peers may serve as protective factors in reducing long-term negative outcomes (Furlong et al., 2003; Osterman, 2000).

"… in the world of the future, the new illiterate will be the person who has not learned how to learn." ~Alvin Toffler (Future Shock)

Kinesthetic learning came naturally to Angela. She was the sixth child born in her family and spent much of her early childhood learning from her older siblings, tinkering with any gadget she could find, and being a fierce and competitive athlete. Angela's birth order in some ways defined who she was, and it also ensured that she knew the family's expectation of success and stick-to-it-ness rested upon her shoulders. Her self-definition was one of the few things she could use to differentiate herself from her broad family. Part of life success comes from finding an identity that will allow an individual to access and cultivate her own

At first I was nervous. I didn't know anyone in the school. My friend ended up transferring to the school from design lab because I didn't know anybody. And um just sticking out the first year and getting comfortable and knowing people. And then I kind of made it my own my second year here.

They (FRIENDS) kind of kept me grounded sometimes when I thought I was like losing my mind at school. They all say you're going to be fine, you're going to be fine. And then I pushed them to go further too. So I don't let them fall back like they won't let me fall back. Like if they noticed I wasn't doing my Chinese or if they noticed I wasn't coming to school they are like, we haven't seen you in a long time.

Um, I would say I've been pretty successful in mastering my path so far. Um, I've networked a lot and I've made friends in high places like at MIT and then never burnt any bridges so just in case I didn't want to go a certain way and I told them that I didn't do it in a way that it made our school look bad or myself look bad. And I could always go back if I needed another job or something. Mastering your path is like finding out what you want to make money doing and be happy doing for the rest of your life.

assets within the context of her world. Angela came to MC Squared with adaptability and an ability to fit in. Her understanding of the need to conform and meet the traditional measurements of academic success was embedded in her by her family and life experiences.

Having five older siblings tell you what to do and show you what can happen suited Angela well.

A fire for helping others and a thirst for knowledge developed within her at an early age. Elementary school proved to be a constant challenge for Angela in many ways. Her desire to help others often translated into trouble. She was not encouraged outside her family for this value, but rather was punished at school for being "disruptive". She was starving for more ~ school was a full of rabbit holes to nothing. Learning to learn, questioning the norm, finding alternative pathways to solutions, and speaking out were all twenty-

90 percent or better and how we were in mastering in the 9th and 19th grade and the ABCs and F and we like, I don't want to see a B. what's a B? You always strive for that 90% or higher. So I never settle for a B I never really liked it. After we we've always had to get that A.

I would say that it brought out skills that I didn't think I had. Like I always to myself. I didn't like working in groups. I loved doing projects by myself but now I like working in groups but also like working by myself. I think I'm more of a people person. And I can convince you to buy a house even if you don't need it.

Then I got more into the Fab Lab a little bit into my sophomore year and that sent me across the country and so I've kind of been in that role as well and from there got me an pulled me out of school and that the same time I did the course work and stuff just not in the class room and that was most of my high school – out of class. So, people say she's never in school but I've never really been in school so I don't really know the underclassmen and they respect me though and they're like Oh she's never in school but I didn't mind it, I made a lot of money in that time so.

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first century skills that came naturally to Angela. Unfortunately, her school's eco-system did not value these uncultivated assets for what they were, but showed a lack of understanding throughout her academic career.

It is funny how life prepares you for each moment; though sometimes only in retrospect can we see the connection of our micro narratives (the small stories that define us) to our larger macro narrative (the theme of our lives). Angela learned to live and fight the abovementioned system; she never gave up. She was frustrated, hurt and flummoxed by how the stated values never really aligned with the expected actions in her schooling prior to MC2. From this came a resolve, an ability to read the unwritten expectations, and learning how to mold herself in any given situation.

(Before High School) You had 7 classes. You know what time it started and what time it ended. As soon as the bell rang you'd rush out of class and didn't want to stay. It was just like so routine everyday – three years. And I would always finish homework faster and teacher never really liked being challenged but here they're like accepting it. But in a regular school, teachers don't like to be challenged and personally if I think you're wrong or I don't necessarily agree with your answer or I don't know why you're answer is right I'll asked you why is that possible or if you're telling me something's directly south and . . Here they're like – oh yeah --- oh really, I don't know that. They more accepting and willing to learn something off of YouTube, even our substitutes. Like before. They have to think they're right and we'll ask Mr. McClellan like can you please find us another substitute because they don't necessarily fit in the way we learn here and they mysteriously have another job opportunity the next day.

When Angela arrived at MC squared, her appetite for knowledge had never been provided a space in which to blossom. Her first experience at the school fit her perfectly:

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she was to introduce a very important dignitary at the school's opening event. This was a critical defining moment for her. She was able to differentiate herself from her siblings with such an accomplishment; she was able to introduce herself within the context of her true person, a learner and hard worker; and it played to her natural assets of knowing how to read and connect with people. Angela's talent that was respected and cultivated that day. Her career at the school was marked with multiple kinesthetic learning experiences and the work she did outside of MC Squared was truly the gift the school gave to her. She learned about different class and cultural milieu from these experiences, and found opportunity to deepen her connection to a community.

Having opportunity created choice and allowed for the cues, routine and rewards that reinforced a healthy motivation and direction. Angela has experienced a great deal of friction in her senior year. Had she not built a strong support system and internal confidence through her earlier years at MC Squared, her ability to survive the friction she faced would have been nearly impossible. MC Squared grew Angela socially and academically to the point that despite the life threatening challenges she faced in the past year, she was able to use her community to support her to be the person she wanted to be.

MARY

Studies have shown that American children perform better on tasks when provided the opportunity to make their own choice on an assignment, versus having a teacher or parent make that choice for them. Mary's choices were real, and she had little choice but to be in charge of them. She was raised in an environment where good choices were exemplified, but not explained. Her uncle served as a surrogate role model for a father. Mary lived in a mixed neighborhood, with some homes that were boarded up and covered in graffiti, others (like hers) that were well kept and spoke of families who really wanted to survive. Mary knew that in order to survive the neighborhood and the clutter of inner-city living, she had to commit to a life that was going to be about school. Prior to high school she had only partially committed to the idea of success, struggling with all facets of self-management. She knew how to work her way in and out of a struggling community, but had yet to prove herself capable of managing

My family is really pushy when it comes to college, it's like not a choice of me not going to college. Cause I knew the struggle that my mom went thru so I knew it was something I had to do. It wasn't a – no I'm not going to college I'm just going to work. No that's unacceptable.

It was like a normal high school, one building, three floors, this class in this room. It was ii they called it boring but at the same time they liked it I guess cause that's what they were used to. They weren't used to moving from building to building. They used to ask me all the time how do you like that going from building to building and I would say that it's better than staying in one building for four years of high school. To go to one building for each year I think is cool.

I've given my all. And I say that because you how some people only give like a little bit, like 50% effort. I always gave 100% and I always tried to give my best self to the school and I think I've done that.

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her anger and frustration, and was easily caught up in the day to day drama of her life. Her bonds at home, while stronger than most, taught her only a portion of what was needed to escape a life of poverty. During eighth grade Mary reports that she made a decision to change her life. She wanted to start over in high school and truly make something of herself. While many children of this age make this decision, the execution and "habit" of a new mind-set are very hard to embed. Mary was serious but also lucky ~ her commitment was met with the right school and time. Her entrance to MC Squared provided her with the unique foundation of "mastery "learning and grading. This

I learned that sometimes you have to depend on other people. I would never before depend on other people like in middle school I would always want to do assignments by myself, So stem helped me realize that sometimes you do have to rely on other people. And my internship at GE made me realize that you have to depend on other people, like you can't do everything by yourself.

I would say my peers helped a lot, because at the time we all research papers to do, so, like STUDENT she was struggling with her research paper as well and we would just meet up with each other and help each other and just try to push each other to do better. It was always like a push from close friends that I had. It was kind of like that. And with whole family, my family would help me sometimes if I was really struggling and I needed the help. But I think mostly it was me and my motivation to do better, I've just always been that way at STEM cause I know what STEM can do for me future wise so me knowing that Only a hundred of us was going through it at the time so it was like, just take advantage of it. While we're here we might as well do going. I always knew that what I was doing was different and like the doors that were opened for me, like my internship, and everything is a plus.

system allowed her to have many "do-overs" without feeling the sting of failure. It provided her an opportunity to be connected in a positive manner to her peers and to be reinforced for good self-management.

A habit occurs from the stimulus of a cue, followed by repetition and reward. Mary was given many new "learning" cues, and they were followed with the consistent expectation of achievement. Once she was able to complete the routine successfully, the environment provided her with the external rewards of social connectedness and goal achievement, while her internal reward was completing the task successfully with little drama. Mary chose to reorient herself to achieve. She had goals that she could manage, and she gained confidence and an appreciation for her own skills from the process. Eventually the new "Habits of mind" developed, and she became a hard worker and a good student.

There are a lot of people who have what it takes to be successful, but few must overcome the difficulties that Mary faced. Those that do often stumble in the process, the obstacles knocking them off their feet; more often than not these individuals are unable to return to the path of success. Mary found the right place and the right environment to turn her

We went to Arizona. Best trip of our lives – well, best trip of my life. Arizona is where we went for a week, and we stayed in the casitas and went to the biosphere 2. Me and my groups studied plants and we found octane on the plants and that as kind of weird cause octane is found in gasoline, so we did our research on that, and those 6 girls I stayed with in my casita I'm actually still close with now and it was girls I didn't really know I was going to roomed with or picked to be roomed with so it was like different personalities again but at a late stage in our years, so it was just like, everybody's still no knew each other but got to know each other better.

And stem has offered so much how can you not be proud of it. And the making it to the end is like a good accomplishment. A lot people just gave up or – yeah just gave up so the people who are graduating now never gave up and everybody is proud that we made it this far and it's still going to be like that when we go to college. When people ask us what school we went to – MC Squared STEM.

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personal bog into a thriving forest. She was able to start with a goal and use the assets around her to cultivate her own latent assets, building a new place for herself. Her own capacity grew with each internship and opportunity. She developed an ability to take the old cues from her community that might have derailed her path to success, and instead use them for support. Lastly, she has been able to sustain the change once it kicked in, using the help of her family and key people at MC Squared to continue the positive direction her life has taken.

Conclusion

Noguera notes that urban schools are often characterized by their urban environment, which is often linked to social problems such as poverty, violence, gangs, drugs and decay (Noguera, 2010). He also points out that two inter-subjectivity factors such as meaningful learning and culture have great promise for enhancing student engagement and gap-closing academic outcomes. He points to the meaningful learning as an important component in developing students' personal values. Noguera's points are clearly evident in the experience of the MC Squared students in this study. While the stories here represent the progression of four years of learning, both the academic and non-academic knowledge needed to be successful; they also tell of a new culture that seems to have emerged as an outcome from the process of a consistent external environment (the school). The students were able to use their experiences and create a resilient framework with the schools help each student to develop fully in a way that would help them survive while redefining themselves and becoming the leaders that the 21st century needs.

CHAPTER 5: FINDINGS

Introduction

Qualitative data analysis is an iterative and reflexive process that this research team began prior to the data being collected. The data collection has included: field notes, interview transcripts, and artifacts analysis. This process of reading through the data and interpreting them continued throughout the project. The data collection process itself was adjusted when additional concepts needed to be investigated and new relationships were explored. Placing an interpreter in the field to record through interviews the workings of each student studied in this process was the emphasis. It was the goal to have this researcher record objectively what was happening but simultaneously examining its meaning and redirect observations, conversations and processes to refine or substantiate those meanings. Throughout the study, conceptual memos were recorded to help sort out findings. Usually no more than a page long, they represented theoretical insights that emerged from the engagement with the data and field notes. As enable hypotheses and propositions were reached, listening and observation became more selective; focusing on those events that might bring the research interests and concerns together in a manner that described the academic achievement of the MC Squared STEM students. This method of dealing with the information amounted to a process that was akin to a dialogue with the data, via the process of sifting out ideas, weighing new notions against the reality and using a team structure for deepening data collection.

Interpretation is a complex and dynamic process that takes attention to detail and requires a critical eye and great discipline. There are many changing rhythms; multiple steps that the researchers went through when choosing how to layout and examine the

data. This chapter reflects this arduous process and prepares the reader to reflect on the data in preparation for the discussion and findings.

There were multiple steps that the research team went through as we collected, organized, and collectively sought to draw meaning from the data. This chapter reflects this process and presents our findings. In the end we decided to organize the data and present our findings around three non-academic factors discovered through our review of the literature as essential for promotion of sustained student success. These factors, or primary determinants are: motivation, self-management and social engagement. Review of the literature also yielded a series of secondary determinants that are the critical elements that help define and operationalize the primary determinants. As noted in the literature review, for this study, the primary and related secondary determinants are defined as follows:

1) Motivation: Includes the extent to which a student is self-disciplined, achievement oriented, responsible, and careful Le et al, 2005): goal orientation, consciousness, and academic self-confidence;

2) Social Engagement: Includes the ability to exchange information effectively with others and the ability to understand and effectively manage one's emotions and the ability to work collaboratively with others. The ability to develop and maintain relationships with others; The extent to which a student (a) feels connected to his or her environment and (b) has available social resources Le et al, 2005: social connection, social activity, team work; and

3) Self-Management (Robbins et al. 2004): Includes the belief that study skills and emotional control (e.g., Elliot, McGregor, & Gable, 1999; Mathiasen, 1984) were

important domains reflected in the self-management See Table 13 for these laid out in

chart format.

Table 13: Non-Academic Primary and Secondary Determinants of Student Success

Primary Determinant	Secondary Determinant
Motivation -"Academic motivation" is defined as 1) academic drive 2) attitudes toward school and learning, and 3) enthusiasm for academic achievement (Le et al., 1995).	**Goal Orientation** – The extent to which a student has functional, well-defined academic goals and is committed to achieving these goals
	Conscientiousness- The extent to which a student is self-disciplined, achievement oriented, responsible, and careful
	Academic Self-Confidence- The extent to which a student has confidence in his or her academic abilities, is willing to use these abilities to cope with academic challenges, and is confident in his/her ability to access the available support structure when necessary.
Social Engagement - The research defines social engagement as social connectedness, team work and social activity (Robbins, 2004).	**Social Connection**—The extent to which a student feels connected to his or her environment, has the available social resources, and uses them effectively.
	Social Activity—The ability to develop and maintain relationships with others and evidence of doing it effectively.
	Team Work—Evidence of Effectively working collaboratively with others
Self-Management - Academic self-management is control over internal and external factors influencing academic performance, including perspectives, characteristics or behaviors (Dembo, 2000).	**Self-Determination**– Evidence of a sense of goal orientation and an intern locus of control.
	Self-Control—The ability to understand and effectively manage one's own emotions in order to reach defined goal and proof that one is doing this.
	Physical Well-being—The ability to recognizing and implement healthy behaviors and evidence of health choices (Ie. Observable traits and Subjective traits)

The works of the research that will be reported comes from the collective interpretation of student voices from the group interviews and the individual interviews.

The group interviews started out with a certain formality that slowly melted away as the students began to share their stories. When the students started to describe their experience at MC Squared a natural rhythm and ease flowed as they shared their stories from a lens they looked through when they came to MC Squared. It was during this practice that students were able to benefit from the memories of each other to further express their development and challenges in their pathway during their school experience.

During the individual interviews, students were asked questions that were aimed at understanding their motivational development and growth during their tenure at the school, what role the school may have played in the developmental process and how the influences helped framed the individual success each student in this study experienced. Their responses to these questions and the subsequent dialogue that ensued provided deepened insight into some of the concepts that were alluded to in the group interviews.

These changes experienced and shared by the students were further described by each participant their individual interviews, at that time they were able to reflect in a deeper more detailed manner about their initial reactions within the group interviews. Students were able to recognize the initial cue that began their journey of transformation and through the group interview process they were also able to feel the connection of others who had a similar growth experience.

The remainder of this chapter will present data, findings, and interpretations through each primary determinant with an emphasis of defining these determinants through the extension and operationalization of the secondary determinants.

Motivation

Motivation is the first determinant of three (self-management and social connectedness) that will be explored in this analysis. Understanding how student motivation progresses over student experience time at MC Squared helps define the role of this primary determinant in the academic success of these students.

In order to further differentiate the data coded within the area of Motivation The primary determinant is broken down into three "Secondary Determinants":

- Goal Orientation- The extent to which a student has functional, well-defined academic goals and is committed to achieving these goals.

- Conscientiousness—The extent to which a student is self-disciplined, achievement oriented, responsible, and careful

- Academic Self-Control—The extent to which a student has confidence in his or her academic abilities, is willing to use these abilities to cope with academic challenges, and is confident in his/her ability to access the available support structure when necessary.

The first group interaction of note begins with three students discussing how they arrived at MC Squared and what in hind-site how they remember their aspirations.

Angela: Well, I came from a family of 6 so I had a reputation at the school as a… so I had to live up to their standards and I had to live under my brothers and sisters and I really really hated that. I always had an extra eye on me

because they just figured I was like my brothers and sisters. While here it's totally different. No one knows you. I was the only one from my school, I lived so far away from the school, so it was like we had to adapt and it wasn't an environment where I was awkward because everyone was new so it wasn't like you're the only person – it's like random.

Raul: Regarding that aspect I would say I guess because we were all starting off new there was a sense of – I don't know – like unity. Because everybody was experiencing the same things everybody could relate to each other more easier What that…I guess was social interactions weren't that hard to start Because like, generally, in elementary school you start with a group of friends and you follow with this group of friends through 8th grade or whatever the case may be and I guess you kind of close the door to socialization in other places because I guess you kind of limit yourself. However, here there wasn't any boundary of that sort so you kind of expand your horizons.

The discussion sited from the group interviews was further expanded by discussions within the individual interviews. It became clear during the interviews that this ease in relating to each other and this common need to accept each other lead to a sense of safety and comfort at the school and having student's basic Maslovian needs met provides a level of trust that is unrivaled when working with people who have truly experienced poverty, as trust is an equalizer. In this case ~ the good will and safety of school provided a place to focus on self in a more in-depth manner while also integrating the outside world. This kind of basic safety provides fertile ground for individuals to find their own passion and motivation, because they no longer have to focus on survival, the school provided them with the safety and security to explore other facets of their worlds. In support of this notion, during the in-depth interview process, Garrett described this in the following manner:

School provided two things: it provided a place where I could be safe and what comes with that, you know food, things like that as well. So I wanted to be safe, number 1 and number 2 I wanted to be here and see what it was like to be challenged and it fulfilled my desire as well for an education so I was happy to be here. So it was worthwhile.—Garrett

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Followed by a second student experiencing a similar feeling expressed himself .as …

> *Ok. That kind of ties in master your own path. Knowing that you --*
> *understanding what you're capable of and utilizing everything you're capable*
> *of to achieve your goals. So its pretty much in my eyes similar to master your*
> *own path and they go hand in hand.—Ralph*

Being able to start over and be safe provides an opportunity to resilience that many

students of the students at MC Squared had never experienced.. In the instance above it

was clear that the students that came to MC Squared took the opportunity of coming to a

new school to start over and reinvent the word around them, while being supported by a

healthy eco-system that encouraged transformation and growth.

Goal Orientation

A secondary determinant of motivation as identified by the literature is goal

orientation. Goal orientation for some students was based on the realization of

what their parents and communities did not have; it is clear that MC Squared

helped many students operationalized this goal-based motivation and converted

it to a more internalized process while in the school. Students resoundingly in

this study took a greater role in determining their direction and appreciable

understanding of their environment as a malleable dynamic place. By reframing

their experiences and attitudes to fall within this quadrant of self-evolution, the

students built, in a very organic manner, a greater intrinsic motivation critical

for true on-going academic success. During the course of the group interviews,

students were able to express the operationalization of this process through their

work. Students experience in the hands on problem-based learning was a

growing process in so many ways when in the field. These students spent time

learning how to solve a real world problem that not only depended on their

academic skills and fortitude of stick-to-it-ness, but it required teamwork and

trust that can often be non-existent in traditional poverty stricken environments.

The students were able to use their social capital and the asset of one another to

be innovative (apply knowledge and use their skill and will) and their

understanding that failure is an important tool if translated properly and used for

improvement in each iteration of their actions. In this exchange the students

were reminiscing about an internship experience they had and what they

believed the experience to bring.

> *Raul: OK. We did had this automated pizza machine and it did not work and Manny over here's frustrated trying to get this to work, we're trying to program it and the pizzas were coming out burnt. The pizzas weren't even getting cooked everywhere.*

> *Angela: We made one good pizza.*

> *Raul: The elevator broke.*

> *McClellan: that way the whole summer?*

> *Raul: The cheese didn't come out of the machine.*

> *Angela: And nobody ate it cause we didn't trust it.*

> *Raul: But then at the end we had to ??? we had to build a company and market this one product and still have a history of like the mastery company*

> *Angela: Achievements*

> *Raul: And… and stuff. We had to have a website, we had to have like a marketing scheme, we had to have a budget and then at the end we had to present out to Rockwell Automation, like the VP was there and he was like, you guys aren't in high school, and we're like, yeah. We were like the youngest people there. They never went under graduating high school – like seniors. So we were the youngest people there and we presented better than they did. And they were, oh we got to get more STEM kids here. So we set like a trend that they kept asking trend kids to come back.*

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Angela: The bloody thing worked for minute

Raul: We did so many trips out to like Strongsville to get parts for it

Angela: Yeah we had to get the new gear and everything

Mae: gear train

Angela: cause we bought

Raul: We learned a lot. Because basically learned what Rockwell did in like 8 weeks

Angela: And there was this cheese machine with like wires; you should have seen the back of it

Raul: Oh my goodness. It was like this ---

Angela: They had two machines, one of them was beautiful and the other was a bunch of wires and guess which one they gave us – the wad of wires in the back.

At the end the students were laughing and grinning about their experience. They talked about the one pizza they made but, more importantly they beamed with the pride that comes from being able to look at a situation, define it, use the proper tools, recover from multiple stumbles and then make a challenge into a treasure.

In the same vein, a more in-depth discussion occurred in the individual interviews. The quote below from student three clearly illustrates his progression from feeling a sense of family responsibility and external desire to please to a certain comfort or rhythm that has become internalized through his experiences at the school.

My mother, on the other side, I guess the opportunity of education was taken away from her because of the conditions within her family and their lack of support and in that situation I still admire her because she was capable of achieving an associate's degree in business however she's always said that she wants to go back to school and if her condition would have been different

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or if her situation would have changed that she would have gone to school and achieved her goals. So she's always told me that I have to achieve everything that she didn't. That's always been something that's motivated me.—Raul

In the next quote, student one started to connect work to the real world and build a healthy environment at school. The new skills learned provided a consciousness and appreciation of differing environments and their value. This process creates an individual and in the case of the school built a community culture of consciousness towards achieving on-going automatic motivation. Garrett described this in the following:

And you start making associations that you wouldn't have done otherwise, in another environment cause you say I know how I can use this knowledge to achieve the goal that the capstone has set out for me. However, with a normal high school or normal education system you pretty much learn learn learn and continue to learn throughout the year without a sense of purpose. I think the capstones give you a sense of purpose in your work.—Garrett

Angela's following quote emphasizes how choice helped her

Ever since I started Rockwell Automation, somewhere , I never stopped taking internships. Um, it's funny because Mr. McClellan and Ms. Timan from GE were arguing about who was going to get me for the internships. Like when I took the internship at the coop ??? next year, because I will be a college student so GE can take me again because…coop or someone at college for the position there. And then Mr. McClellan needs one to run the Fab Lab so they're debating –no I'm going to get her – no I'm going to get her. The internships were fun. And I liked them. Once again, I like money so . . . I always tried to optimize how many internships I can do., So I started at Turner. That was in the morning. And then I scheduled Fab Lab after that and I did ???? and after that. So I had a full week. So you can't imagine how I got my class work done. I don't even know how got my class work done. But I got it done and I still managed to get A in the classes. Somehow I worked it in there, with the flexible scheduling.—Angela

The fortitude to complete these assignments and connect them to prior experiences as the igniter of motivation was evident. It is clear that learning to embed failure as a part of the process and an important factor of outcome success. The second part of the data here begins with the discussion of mastery in the

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groups and then the more personal n-depth experience that individuals share in their own interviews.

Conscientiousness

Conscientiousness is another secondary determinant of motivation; it is first defined in the literature as the extent to which a student is self-discipline, achievement oriented, responsible, and careful. The following exchange was a story about presenting information learned as part of a PBL experience with the expectation underscored that in order to move forward mastery was expected. It demonstrates that beginning of this quality becoming embedded in the student as a habit and process from the type of required learning and approach to learning that occurred in their tenure at MC Squared..

> *Angela: I thought I was the stuff. Me and Jody gave a 20 minute presentation, We ended up kind of like cheating cause we each did 10 minutes and were supposed to do 20 minutes each, and kind of like tricked the system. We just thought we just knew what we were talking about – bio fuels and wind energy and comparing the 2 and we just talked in front of all these people like we just knew what we were talking about. Couldn't answer half the questions but we felt like … cause everybody was all eyes on us. Cause they didn't know half the stuff we were talking about anyway. So we could have talked about anything and they would have believed us so we just felt like we had all the power and that's what shaped me in 9th grade to keep me successful. I liked the feeling of knowing more than the next person.*

> *Facilitator 2: Great story, too, actually.*

> *Mary: That's a tough question. Going back to 9th grade – the sustainability conference. I had the opposite thing, where I walked in there, even though I had done a lot of research on my topic and walked in there felt insecure about how much I actually understood and when I went to give the presentation I kind of on myself from an outside voice, told myself another perspective and kind of realized I did know quite a bit about what I researched and I mean there's always this fear that there's always somebody who's an authority on the matter and if I say something wrong this person's going to jump on it and say no you're wrong so that's why I've always been kind of paranoid about getting understanding everything as much as I can so in that case in that aspect I was kind of scared to death when I gave that presentation but I guess*

it gives you like a confidence boost so you can talk about something and someone understand it.

Through mastery and this experience at MC Squared, there was a creation of a pathway for individual intrinsic motivation but teaching students they could indeed achieve and that process was the true outcome. Understanding that if they could do something over and over again and it would only count when they achieved an A, it provided the Pavolovian training needed to set new skills into action and build student academic self-confidence. Mae in the in-depth interview commented in the following manner about mastery:

> *With mastery – we've been doing mastery since 9th grade. And that's where you have to get 90%or above you can't get 81% or it won't be mastery. It'll be an F basically. We've been on that grading scale since 9th grade then they changed it during 11th grade. It goes to ABC or F.*—Mae

A second student expressed a similar pattern of thinking in the in-depth interview as well,

> *With one of my research papers, I think I got like a 71% which is basically an F. So I just had to redo it with all my teacher's corrections that she put on there and I just re-read it to make e sure I put 100% effort in it and I think I got an 88% so I had to redo the whole thing and I got my friend to look over it and she put her punctuation marks on it and anything she thought I was missing and once I re-edited and my final final draft it was 915. It's a process. You have to keep going back and making sure you know what's wrong with it.*—Mary

Students who have realistic dreams and vision of their future, an understanding of how to their aspirations can be obtained and what to barriers they may face but what assets they have and are connected with builds opportunities for new growth and goal fulfillment. Angela through her experiences was able to learn to create a connection and internal process that provided a link from school work to the real world and has developed again a more organic understanding and motivation to achieve.

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Academic Self-Confidence

A third determinant of motivation as noted in the literature review is academic self-confidence. This is defined as the extent to which a student has confidence in his or her abilities, is willing to us these abilities to cope with academic challenges, and is confident in his or her ability to access the available support structure when necessary.

During the conversations students stated that they were not always confident of their academic skills. Garrett said:

> *So as a kid I really didn't understand that I was gifted or anything. I didn't know myself to be anything more than just a normal kid and that's just how it was. And I still kind of am that way. But after getting involved in that and getting to understand the content ?? a lot of the kids in my class ??? your idea is dumb, so for me to understand it, it made me feel actually kind of an outsider. So I just did my own thing in the science fair project and when I won people tried to pretend that they didn't understand. I changed my social standing as far in school. I had been that kid that's never there but I became cool like I had a body of people that liked me, you know what I mean?—* Garrett

Mae talked about a time when she did not believe that she was capable of going to college.

> *I guess I changed. But I see it, I think about it every day. I have changed, and I never thought I was capable of doing anything like – I just thought I'd – I never really thought of anything, but this school made me think, really really think. It made me think that anything is possible because it is. And you can have help and you can get help. You can actually do these things. You can go to college and actually graduate and get a job and be successful. I'm just praying it happens, I'm praying so hard that it happens—*Mae

The next interaction from the group interviews plainly emphasizes the importance of the social anchor that the peers had become to one another, the school had acted as and the faculty had become to the students. This new perception that students began to develop around community and their role provides them with the first opportunity to entry to a class outside of their own experience as well. Lastly, because of the years of

progress the students experienced at the school, they are able to frame their experience in

the knowledge that the process was indeed the outcome.

> *McClellan: The next question deals with the tools that you learned at MC Squared STEM. besides, what kind of tools have you learned since you've been here that you think are going to help you in your future. You don't have to be like – quadratic equations, necessary unless that's the kind of stuff you …generally. What did you learn while you were here that's going to help you in life?*
>
> *Angela: My favorite thing is presenting nowadays. I remember it was either the end of my freshman year r beginning of my sophomore year and Mr. McClellan just sent me to Columbus and said you just got to present and so I'm just thinking nothing of it and I get there there's all these senators and on top of that I had to write my own speech 20 minutes before hand it was like it's really important that I do well and there were astronauts there and I thought my goodness, I don't know. But then I've never not been in a presentation that's not been important to our school so it's, when I go out and present for the school they're like, you're not in high school and I'm like yeah, I am, I'm a senior. No you can't be. Yeah I am. And you can pull any of us out of class and we'll be the same because we've just been pushed whether we want it or not to give interviews and tours and guides to random people that come to our school.*
>
> *Raul: I would say self-sufficiency. It was a great tool that we learned here. Once you get to your second year you're pretty much given, not free reign but I guess it's more open. You can make decisions. For example, there's PSEOP options, there's internship options, so I'd say, in those specific environments you get to be self- sufficient, and you're responsible for yourself. So I think the school has done a great job at teaching you to be independent.*
>
> *Ralph: I learned self-discipline from the school. When I first came here,… but when I leave, I think I made an effort, I think I made an improvement. So when I leave here I can take that with me. Like I said, that's one of the tools I learned.*

Knowing how to connect to a group, use that group and build a new set of

norms that can create an environment for the confluence of differing ideas and

merging of differing socio-economic classes. This process is critical to creating

habits of the mind that will become instinctive and allow the students to move

from class to class with confidence regardless of context. This very practice was

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also identified as a key factor in the shift to student owned motivation; the
conversion of external motivation to internal motivation and self-agency belief
was set in and entrenched as a deep learned personal advancement for the
students.

In the next quote, Garrett (during their individual interview) started to connect work
to the real world and build individual self-actualization and a consciousness for through a
healthy environment at school. The new skills learned provided a consciousness and
appreciation of differing environments and their value. This process creates an individual
and in the case of the school built a community culture of consciousness towards
achieving on-going automatic motivation. Garrett described this in the following:

> *And you start making associations that you wouldn't have done otherwise, in*
> *another environment cause you say I know how I can use this knowledge to*
> *achieve the goal that the capstone has set out for me. However, with a normal*
> *high school or normal education system you pretty much learn learn learn*
> *and continue to learn throughout the year without a sense of purpose. I think*
> *the capstones give you a sense of purpose in your work.*—Garrett

The following quote from Mae supported the above assumption. She describes her
experience of going to the biosphere:

> *Biosphere 2 well just based on the focus group you know how amazing that*
> *was. If I had anything to add to that discussion it would be that it's definitely*
> *an experience I would like to repeat. They should never stop implementing*
> *that. I mean everything was an advantage, There was nothing I can say – they*
> *was nothing I would undo about the biosphere. It was a great learning*
> *experience*—Mae.

The Mastery based grading system was referenced many times as a key
component in the development of academic self-confidence and a belief that they
are capable of reaching their academic goals. Mary talked extensively about this
during her in-depth interview:

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But with mastery, I think that was a great way for us to be pushed. I was like you either get an A or an F. Who wants an F, so it was like we have to get an A. So I think it pushed everybody, opened everybody out of this school… if you don't get 90% you've got to either redo it or just get an F on it. So I think our grading system is a great way to push students to do better than what they already did before.

Mae stated that the school's approach changed her:

At first I thought ok, how hard can it be to get just to get an A? And then when I actually started doing a paper or workbook or sustainability or stuff like that it became like, it's actually a good system, cause you – if you do real bad on a paper you can go and revise it. So you can get your mastery. So its kind a cool because who really can go back and reo their work? You have to do something else just to get your work … So we can actually go back, revise what we did wrong, and learn at the same time. We learn even more than we did before. So that's why I like it, especially working on research papers. You can actually go back and revise what you did, learn what you did wrong, and improve it.

Having the academic self –confidence to utilize individual and external resources to reach a given outcome is the result of strong internal motivation embedded in the advancement of self-confidence and community support. Both of these attitudes and words reflect an in-depth balance of using leveraged learning, metacognition and community as a means to achieve a healthy outcome. This process is critical for motivation to root and proliferate within the student and the community as an organic and rooted transformation to strong motivation.

<center>Social Engagement</center>

The second primary determinant identified in the research and used to explore the data was Social Engagement (the second primary determinant used) was broken down into the following Secondary Determinants:

- Social Connection-The extent to which a student feels connected to his or her environment, has the available social resources, and uses them effectively.

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- Social Activity-The ability to develop and maintain relationships with others and evidence of doing it effectively.

- Team Work-Evidence of effectively working collaboratively with others.

These three "Secondary Determinants" were used to further differentiate the data coded within the area of Social Engagement from each of the individual interviews.

Team Work

Team work is defined as the evidence of effectively working collaboratively with others in a manner that provides opportunity for shared knowledge, knowledge generation as well as respects the individual within the context of the overall group. During the group interviews evidence of this was prevalent. Students shared through their words below that they has a school culture of support and that the students looked out for each other. There are several exchanges that the research team saw evidence of how the curriculum organically rooted the construct of team into the process, and provided a grading scale (mastery) that fostered support versus competition. The following two exchanges demonstrate the beginning stages of teamwork rooting, based on the school design and implementation of the design; and the second couplet demonstrates how it became a part of life and a "habit of mind" for students to actively work together. The first is from one of the group interviews:

> *Mary: Socially it's not that difficult to interact as well because of the structure of our school and the way the material is taught. We usually work in teams or projects so through that medium you can also come to know people while you're working with them, so you not only understand them as a friend but also as a colleague.*
>
> *Ralph: I don't know --- I wasn't here in 9th grade but when I came here in 10th grade it wasn't that hard for me to make friends …. Everybody's open here….I started meeting people the second day I came. People was always*

talking to me. I – it was different cause when I went to x-school. I hated my 9th grade year. I knew people but the people I knew I didn't meet them until a month or two later in the school year but here, it was like in two weeks I knew almost everybody in the school.

(Discussion of event during the same exchange…)

Mary: I remember that.

Ralph: I don't know. I think it was because I was the more outgoing person and always like the talker for the school so. That's another thing about our school if you don't – if you see someone new, everyone attacks, well not like in a bad way, wanting to be their friend and want them to know what we know about the school and like administration and stuff. And we didn't want him to feel like he was by himself or anything.

The second exchange noted below shows how the process has become

embedded and took on a new form of team work…

Angela: Raul left and went to college in like freshman year. Garrett decided to do college and internships, I went straight into internships and my other friends went into art and stuff so like we all went separate ways but we still connected on days we were here or outside the school. We don't hold each other back, is what I'm trying to say.

Angela: Yeah. They each take their own path.

Ralph: And we're all successful.

McClellan: What about you?

Ralph: Uh, me and all my friends, we kind of stuck together. We're all going to the same college. I don't think we're going for the same thing but we're all going to the same college. But we all leave June 21.

McClellan: So the second part of this question really is what advice would you give other students to help them be successful. What would you tell them?

Angela: I would say we made a lot of excuses. We kept blaming stuff, we kept blaming other things and why we we're happy but we could have made stuff change a long time ago. We could, actually, pushed it so like, I would tell them if you want something done, do it yourself and then get it done like the way you hope it would and that way you can't say well we couldn't get this or we couldn't get that.

Angela: I would say don't be scared to ask for help and make the effort you got to make the effort to do the work.

Student's learned to gain consensus (work collaboratively and appreciate each other's assets) while understanding the importance of social cognition (e.g. empathizing in a healthy manner). They supported each other like a team even when they were not at the same place or doing the same work. MC Squared become a team like a functional family for these students. They knew they could depend on one another.

In the in-depth interviews there was the same evidence present. The following set of quotes reflects the characteristics that are seen in the building and functioning of a healthy team.

> *Some people were struggling with them. When we – some people don't work well in groups or they expect one person to do it all or they expect –well, I want to be like a smart person in the class and it just doesn't work cause they're just going to be frustrated or they go I would like that too but I will still make you do all the work. You're going to do this or you're going to like - like it so … they struggle. Like wanting to finish a project but then they hit the slump of: I don't want to this some more, this project is stupid. I don't get it. I'm frustrated. The circuit's not working. And then they get … up a little bit because a smart person is saying or pushing them to be like – just get it done, if you just work a certain way. So then – after a while they got used to the whole – I want to get this project done.—Angela*

Raul reflects on he learned to utilize the skills of others to grow academically:

> *I would help where I could. Some of the mastery involved writing an essay and some people just decided not to do the essay. I can't help with that. However, like with my friends, I proof read all my papers and they proof read mine, and there's this collective proof reading thing. In math class we look over our homework before turning it in to see if everything was okay. Because of the project based learning structure we would be in groups of students and I felt thaw s my greatest opportunity to contribute because some students might have been disoriented at times during the class and that's where I could go and clarify it and help them over the hurdles because sometimes, and this is in all education structures I feel, an instructor can teach well and his teaching method will only will be conveyed to those students who have an*

aptitude for that type of method over another teaching method will leave a gap for other students that simply can't be avoided, so I had the opportunity to see this and help where I could.

Here Mary talks about learning how to communicate and work in the team

because of the structure…

> *So I stayed in a little cabin with 6 other girls and everybody was talking like everybody was talking and everybody was trying to see who liked this kind of music and what do they do outside of school, what school did they come from. Living in the cabin with 6 other girls I didn't know actually helped m; it kind of forced you to talk. You didn't want to be sitting there, the only one sitting there and not opening up when everybody else is opening up and actually trying to get to know each other.—Mary*

This comment was reinforced by what Ralph said about his experiences working

in groups and how that works made the school closer;

> *I think the thing with us was every time they grouped us with different people we all became friends. We all got closer. So that helped us to get things done. Well give me your number and I'll talk to you and tell you how I'm doing or you do this cause you're good at this or well I'm not going to be there but can you – just little stuff like that. But we don't always get our stuff done. Even when getting it done cause it was easy. Even when you have to research something. You research it, you summarize it, you get it done. People worked really hard. People – like everybody that I was grouped with – everybody worked hard. So I guess we helped each other out.—Ralph*

Lastly, Garrett expresses the value of knowing you have team. It created form

him a sense of purpose and community that would be there no matter what

happened. It also gave him purpose to be there in manageable and meaningful

ways for his peers.

> *It was like that confidence booster and for us to be able to accomplish the things that we have, our…so many people and being able to present to all those people, be confident in the information that I was giving out it made me feel really good about myself and made a lot of kids feel really good about themselves. And everybody was believers. Everybody. Everybody that was there believed in each and every one of the students. And so to know that we could produce that kind of community definitely made us, all of us, feel like we*

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*had a chance or a shot, even people who probably weren't even thinking
about going to college before they came here.—Garrett*

Social Activity

The second determinant within Social Connection was Social Activity-The ability

to develop and maintain relationships with others and evidence of doing it effectively.

The students who discussed their ability to do things at school and maintain relationships

were often surprised at how this transformed their own identity and patterns. The below

conversation came from a series of interactions with all the students talking back and

forth about how they found themselves connected without even realizing how it happened

and why, and how in turn they were able to use this connection as a positive and turn to

their relationships to support positive growth.

> *Ralph: I think during 11th grade is when me and my friends really got the
> closest. That's when we started making each other come to school.*
>
> *Angela: You stayed in school.*
>
> *Ralph: I remember one day we wound up – me and Mark was the only
> ones who were going to go to school, Nobody else was going to go to
> school so we went to get Steven and then going to the west side to go get
> Maci and then still making it here on time.*
>
> *[laughter]*
>
> *McClellan: That was an odyssey.*
>
> *[laughter]*
>
> *Ralph: Ever since then, none of us… like today, I didn't expect them to
> come to school , Mark has been losing his phone all weekend. Losing, it
> getting it back. I don't know, I knew they were going to come today
> though.*
>
> *McClellan: So everyone's pretty much caught up with everything too,
> right?*
>
> *Ralph: yeah.*

McClellan: What was it like when they left? In 10th grade everybody was here and in 11th grade, she was off doing her internships and you stayed. Did it change the way school was at all?

Ralph: Yeah, kind of. I know when I heard Raul went to college I was like damn, I wish that was me,. It started making me work harder.

Angela: yeah. Raul pushed everybody. If Raul can do it I can do it. We thought we were little Raul's.

[laughter]

Angela: Raul was like the school mascot.

It is clear that the students were able to transform their social activity into constructive community growth, expectation and transformation. A new culture emerged from the expectations that they created for themselves at the school. We can see further evidence of this in the individual interviews.

This first comment shows how the social activity of school helped this student redefine her family and her understanding of this into a healthier and manageable structure. She took her old lens of viewing social activity and redefined here.

There was a memory that I have. In tenth grade, we was leaving to the new site, I remember one of my friends, while Mr. McClellan was standing up, well he started crying. Cause we were moving to another site, cause we were like growing up and stuff. So one of my friends she yelled out It's okay sugarfoot. I would lock that away because we care about each other. I would lock how many moments we all shared together, away. I would lock all my 9th grade teachers away because I want them back. I would lock them away and never give them away. Mr. McClellan would go in that box. My friend would go in that box.—Mae

She goes on further to explain how the school impacted her ability to communicate, thus improving her chances of succeeding in academics.

So now I'm just out there. I'm outspoken, I love to talk, I to conversation – socialize – even give people advice. That's just what I'm about in my life. Before then you couldn't ask me for nothing . You couldn't ask me a question

– I wouldn't answer. I was the type if you asked me a question I wouldn't say nothing.—Mae

Peer to peer support and learning, support, intervention, peer to peer mentoring and teaching was critical. Students redefined themselves in terms of their school family.

Social Connection

Social Connection is the extent to which a student feels connected to his or her environment, has the available social resources, and uses them effectively. This first exchange in the group interview where student A and C discuss the impact of having to work together and what transforms to the community from the process.

> *Angela: I thought I was the stuff. Me and Saul gave a 20 minute presentation, We ended up kind of like cheating cause we each did 10 minutes and were supposed to do 20 minutes each, and kind of like tricked the system. We just thought we just knew what we were talking about – bio fuels and wind energy and comparing the 2 and we just talked in front of all these people like we just knew what we were talking about. Couldn't answer half the questions but we felt like ... cause everybody was all eyes on us. Cause they didn't know half the stuff we were talking about anyway. So we could have talked about anything and they would have believed us so we just felt like we had all the power and that's what shaped me in 9th grade to keep me successful. I liked the feeling of knowing more than the next person.*

> *Facilitator 2: Great story, too, actually.*

> *Raul: That's a tough question. Going back to 9th grade – the sustainability conference. I had the opposite thing, where I walked in there, even though I had done a lot of research on my topic and walked in there felt insecure about how much I actually understood and when I went to give the presentation I kind of ??? on myself from an outside voice, told myself another perspective and kind of realized I did know quite a bit about what I researched and I mean there's always this fear that there's always somebody who's an authority on the matter and if I say something wrong this person's going to jump on it and say no you're wrong so that's why I've always been kind of paranoid about getting understanding everything as much as I can so in that case in that aspect I was kind of scared to death when I gave that presentation but I guess it gives you like a confidence boost so you can talk about something and someone understand it.*

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In this second exchange the connection helped Ralph avoid repeating bad choices of the past and gave him a structured and safe manner to change a challenge into an opportunity. This same boy has experienced serious gang violence and for him to find a positive social connection instead of turning to old routines was a monumental growth point for the boy, the community and the school.

> *Ralph: OK. Well, I was in 10th grade. I was here. Me and him went to school together and we didn't like each other, like I didn't like him, he didn't like me, Mr. McClellan knew it, our parents knew it and it was a school dance and Mr. McClellan was talking to us and he just told us, like he had been having talks with me about my behavior, telling me that I need to improve and we got to the dance and they thought it was going to be like some type of trouble so what wound up happening was…it's funny because as me and Mr. McClellan had had a talk, I came to the dance and me and the boy actually wound up becoming friends and now I call him my little brother. So learned self-discipline and I got another friend.*

> *Facilitator 2: Great story. Were you surprised?*

> *Ralph: yes. I was.*

During the course of the individual interviews there was tremendous evidence that supported the value of capitalizing on social connection. In this set of quotes, we can see students were able to gain an appreciation for how small self is within the greater community, while appreciating the contribution of any one individual. They also found the value of an advocate or a team of advocates ~ and how to create this team to leverage individual growth and lastly and most importantly they learned how to trust.

> *I learned that sometimes you have to depend on other people. That was something that I learned in 9th grade when we started doing the sustainability presentations. I would never before depend on other people like in middle school I would always want to do assignments by myself, So stem helped me*

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realize that sometimes you do have to rely on other people. And my internship at GE made me realize that you have to depend on other people, like you can't do everything by yourself. And that's something that stem high school taught me. You can't be independent all the time.—Mary

In this quote we see the trust begin.

They (FRIENDS) kind of kept me grounded sometimes when I thought I was like losing my mind at school. They all say you're going to be fine, you're going to be fine. And then I pushed them to go further too. So I don't let them fall back like they won't let me fall back. Like if they noticed I wasn't doing my Chinese or if they noticed I wasn't coming to school they are like, we haven't seen you in a long time. —Angela

This student learns how the value of community can make be the best he can be.

But the challenge also regarding that was I when I was younger I've always been on the timid side. More of a – I never really enjoyed small talk or simple talk. I always wanted to get to the point. And that kind of made things – like when people would start talking about music I would say okay I like and that would be the end of my contribution. So when it came to presenting I would just blurt out facts that I had learned. It wasn't that interesting. And I also learned to socialize better because in this school, whether you like it or not you have to speak to people and you have to interact and that really helped me and I was really glad I was able to participate in that, cause if I went to normal high school I'm pretty sure I would still be a timid person and not enjoy speaking. However at this school due to the nature of our school and the way were taught to be presenting, I not only improved my presentation skills, I became more comfortable speaking and I think that's a pretty good tool, really helpful.—Raul

Garrett talked about how the accessibility to the teachers as people helped him to

connect socially;

It means a lot because some kids in high school never grow a connection with their teachers. Sometime they hate their teachers, sometimes they don't want anything to do with their teachers. With me, they really cared about what you do, and they really want to see you succeed in what you want to do in life, and so the connection I have with them is outstanding cause I can got to them with anything, I can go to them just to talk, it doesn't have to always be about school.—Garrett

Learning how to be a member of a community that is "productive" and having

students overwhelming respond that they enjoy coming to school are also

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indicators that the culture had changed to further support academic growth by building a safe community, a cornerstone of Bransford's How People Learn.

<div align="center">Self-Management</div>

The last determinant that we will examine through the data in this chapter is self-management. Self-Management, the third Primary Determinant was subdivided into the following three Secondary Determinants:

- Self-determination-Evidence of a sense of goal orientation and an internal locus of control

- Self-control-The ability to understand and effectively manage one's own emotions in order to reach defined goals and proof that one is doing this

- Physical Well-being-The ability to recognize and implement healthy behaviors and evidence of health choices (I.e. Observable Traits and Subjective Traits)

In learning to create a new habit scheme to manage self not only within the context of a challenging external community, students had to adjust to the physical and chemical changes taking place in their bodies. The first secondary determinant of this management is self-determination. –The following exchange begins to show how students were able to internalize goal orientation and redefine an internal locus of control

Self-Determination

It is clear from the data that students felt as though they were able to find their passions that these passions helped the students to keep themselves moving towards their goals when their motivation might start to wane. By starting with the project or the

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system, it took the emphasis off of the student and forced it to become accessible and

flexible to help student redefine themselves within this context. This exchange from a

group interview illuminates this process.

Angela: Fab Lab. That's when I got introduced to Fab Lab. And I never left since. Working with all this cool equipment, had the lasers, you had the shop bot, had this cool little sticker maker and it was like, it just had everything, you could stay busy for hours., I never left school, I always got in at 8 o'clock and I just never wanted to leave. I always did way extra than you had to do on a project just because I could, with all these LEDs and working with the laser and out stuff. It was just fun. Fab lab changed my life.

Laughter

Ralph: I definitely have to agree with that, Fab Lab and I guess we started getting more hands on projects at GE. That's when we first started with, you get to make a robot or parts.

Facilitator 2: Oh talk about . . .

Raul: we got to do really interesting stuff with the equipment they have there. It was pretty cool. I guess the Science Center. it was pretty amazing. I wish I would have had more time with the Fab Lab Afterwards.

Angela: I think Arizona, the Arizona trip to Biosphere was pretty neat. That was my only time, well it wasn't my only time now, cause I went to Kentucky, but it was my only time going out of the state was to Arizona and KY, it was fun, it was nice. And I actually learned a lot there.

Ralph: Yeah it was cool.

Facilitator 2: What did you guys learn (?)

Angela: we did – we took soil samples from all the different bios.

Raul: that was part of the VOC group. And we thought we knew what we were talking about – about octane and it – there was a grad student there that was working with like VOCs…Or something and he was like can we use this research in our dissertation or whatever you do when you're a grad student and we were like, yeah, you can use whatever you want. We thought we were all special and needed. Like we actually knew what we were doing, but we didn't know what we were doing but it was just fun.

It is evident in this exchange that belief in self is developing and on a continuum but is

critical to individual and collective growth. The group also shows how the school helped

them to become a new kind of learner and citizen within the context and framework of

the school. The following comments by Mary during the individual interview help us to

understand her journey through this process.

> *I would say it got stronger, because each went on and I knew I was going to graduate, so come 10th grade, my focus was on 11th and 12th grade, I was focused on 11th and 12th grade, so when 11th and 12th grade I was focused on college . So I always stayed focused when it came to my grades and knowing that that's what colleges will be looking at. Then once I get into college, I have to stay focused on my 6 years to get my master's degree. And the once I get my degree it's staying focused on getting a god job. It's like, folks just stay focused. Please.—Mary*

Perseverance is needed in order to reach one's goal. Raul talked about how he has

developed the ability to adhere to a task until it was completed.

> *As a student. I think the only reason I've gotten this far aside from my motivations, is simply dedication. I feel that sometimes, well any time I don't understand something I go to extensive lengths to understand. Even when things are difficult or things seem impossible I just continue to go at them until it works. I guess as a student, I might not be that I'm the smartest of people or I'm the most advanced of them but I think that I possess a lot of determination which is something that a lot of people that I feel a lot of people lack. And I feel that if a lot of people who are normal intelligent would just have a little more dedication to what they are doing they would get so much further in life. But I think one of the most important aspects of myself is dedication.—Raul*

In order to be successful it is important for one to understand his/her limits and be able to

reflect upon experiences in order to determine why one was not successful in a certain

situation. People who are able to do this are able to understand how to improve and able

to manage setbacks.   Raul talked about how he has learned to understand his limits:

> *well, what I took on that semester was probably tougher than what I took on tis past semester and just finished and the reason was because I didn't consider the overlap between college applications, scholarship applications*

*and the semester within itself,. And the courses weren't easy at all either. So
however that taught me a great deal about responsibility and where my limits
were which is extremely important because now I know I've hit this level and
if I go above this I'm going to have more trouble and it's generally something
you want to avoid in college and later on in life. And you have to know where
your boundaries are. And aside from that I guess, originally when I started
PSOEP I always had the focus that I needed to get an A in everything because
of the mastery thing. So I always tried to get above 90 in everything and it is
possible and it's nothing – I don't know I guess the mastery thing kind of
encouraged me to continue that and plus its kind of bad to lower your GPA in
college. And that's another thing you have to make sure the students are ready
to enter PSEOP because they might understand the concepts however they
might not have that maturity or responsibility yet and that might negatively
affect them on their first or second semester of PSEOP, it depends, and that's
not good. There is a certain learning curve. But – some people might feel that
it's huge, some people might not, so it's definitely something you have to
watch out for.*—Raul

In a traditional school environment students are not provided the opportunities to manage

their learning and make choices, therefore they do not learn the skill necessary to manage

their time when they have freedom in college or the workplace. Angela Talked about the

set-up of the school helped her learn to manage time on her own:

*It's all about time management and if you handle it you have more
opportunities. For example we had art our first 2 years and we don't have art
anymore. Usually you just take your arts last but we took our arts first so our
art majors, our artists in the school didn't really have an outlet anymore so
then like anytime whether you were ahead of time or not he would find art
internships . He'll push you to go to that because we don't have outlets like
sports. It just depended on the student.*—Angela

Self-control

The second determinant within Self-management is Self-control this is defined as the

ability to understand and effectively manage one's own emotions in order to reach

defined goals and proof that one is doing this. During the different discussions students

referred to some of the challenges that they faced outside of school. Student 1 referred to

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his difficult struggles he faced while growing up and he summed up his ability to make it

to luck:

> *But it was just good luck on my behalf that just kept me out of a lot of trouble but I had to like grind it out so even with my health issues and things like that, where my home situation being as rough as it was I didn't have that same support at home either and I had to just equip myself and ready myself for the storm and I just had it tough and kind of adapt.—Garrett*

Student Four talked about the loss of his brother to gun violence and his own subsequent legal challenges related to his dealing with an aggressive local gang:

> *Challenges I faced. I went through a lot of challenges. The stuff that happened with me and my brother. That was a challenge and then I actually got accused of shooting somebody.—Ralph*

Mary talked about a life filled with drama:

> *When I got here it was drama of course, but it wasn't like the kiddie stuff that was in elementary. Especially with 10th grade. I could have been so rude to people, I could have did things that I wasn't supposed to, but I didn't. so like dealing with drama in elementary and dealing with drama in the high school, I mean there's going to be high school drama but we act so mature you would never really know. I mean there were times people were acting childish but some of the situations I was put in with drama I've always been mature. I mean I might have been – I'm not going to lie -- but I'm not really the type to care about drama. But drama in my world is...*

Students discussed how the school and the openness of the environment helped

them to learn how to manage under adversity and new conditions. The school provided

both the shelter from the challenges that faced the students outside of school and the

window into what life could be like. The school helped them to become adaptable. This

group interview exchange is a good example of this:

> *Mary: Yeah, cause it was like you're still learning the questions,…the right answers… the wrong questions, so it was like everyone was figuring out what to do and then every class was an interesting size….You learned how to block everything out after the third week so it was like – it was just tune in to the class and then with all the projects going you were either thinking about another class and worked on that project in the class or you were excused to go work in the class or … it was just fun and to me it felt like a – we claimed*

it as our own high school. We had to move to different classes and weren't in one classroom the whole day with the same teacher for an hour and a half. You got move around and interact with other for about 45 seconds but it was still . . .the whole changing classes. It didn't

Mae: We didn't have lockers -- the yellow bins. I'll never forget the yellow bin. You just threw your coat in it. And just hoped it was there at the end of the day.

In his individual interview, Garrett was able to describe the way that the school supported

his development in this area when he said the following during his individual interview:

I had so many options it was like where do I find my place to fit in? And I was fortunate enough where I had enough traits from each area that I just kind of balanced it and everybody liked me.—Garrett

In regards to this, Mary said the following:

Mary: It was um cool. I was more expressive, I was more, I was more violent. And when I say violent I mean I was more for fighting and stuff like that. And I guess that just came with me being immature at the time, so like 7th 8th grade, that's what I was – I would still keep my grades good but I would let the he say she say stuff interfere. Yeah, it would get to me and I wasn't afraid to express it. But now – I made a vow before I came to stem, I was not going to fight, I was not going to get into no he say she say so – cause I wasn't going to get kicked out, cause Mr. McClellan don't play, he don't. So I would say I matured from 8th grade to 9th grade. I was more childish n 8th grade so I guess it was just maturity. I was immature in middle school. And once I got to high school I wasn't immature. I mean I slowly became mature. I guess that's just growing as a person. I guess stem helped me grow as a person, I wasn't as expressive. I bit my tongue a lot on drama. I just try to stay away from it.

Mary went on to state that she feels that she learned one of her best traits today

(her ability to listen for meaning) because she was forced to sit down with

teachers and understand:

My best skills? Listening, listening was a big part of trying to understand something I didn't understand so – once somebody would say something to me I would understand it but I wouldn't understand it and I would have to sit there and actually listen and try to understand what that person was saying so, like if I didn't understand something at school I would have to sit down with the teacher and actually pay attention and listen.—Mary

Ralph talked about how the school's year-round calendar helped him to learn how to be disciplined:

If I can go to school during the summer than what makes you think that every day in the winter I can't do what I need to do or what makes you think that I'm going to skip – I haven't skipped a day here.—Ralph

Several students talked about the actual school locations and how the students knew that they had a special opportunity by where they actually went to school every day. The follow quotation from Angela's interview is representative of these feelings:

I would say the campuses are very important. Ever since 9th grade when got to the Science center campus - -that in itself is amazing. I'd never been to the Science Center before that so to be going to school every day on the science center campus it was fun, cause we got to see all the new exhibits and like art classes were mixed up so one class would be all the way upstairs in the loft and another class would be downstairs where the exhibits were, and another class would be in this part of the building. We got so comfortable with the building and all the exhibits, and the science center staff talking to you – it was cool. And to transfer all the way over to GE Campus. That campus was probably like the best campus we've been to. It was so big and so many buildings and we learned so much about GE that we didn't know before. So to go from the science center to GE it was just like – it was cool process. Everybody was like wow. Instead of being in a regular high school building, compared to that it was impeccable.—Angela

Physical Well-being

The third determinant within Self-management is Physical Well Being. Physical Well-being is described as the ability to recognize and implement healthy behaviors and evidence of health choices (I.e. Observable Traits and Subjective Traits) In regards to physical well-being students talked about how they had gained an appreciation for the outdoor world and became more aware of their physical well-being.

Raul: It was amazing. We lived in a like casita. There was this hill with cacti/cactuses all over the hill and our chaperone was a photographer the first thing we did when we got there was go up the hill cause there was a nice view,

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and the photographer wanted to go up there too so were like, okay, you go up this way and he started going up and got stuck in the cactus and…getting up there. It was pretty funny.

Facilitator 2: That's hilarious.

Raul: And we started…prickly pears and john started eating them and he got a whole bunch of thorns in his like…because he didn't know there were thorns in the actual fruit. Pretty funny experience.

Ralph: We went on a night hike and…and nobody seen it but Mr. Johnson. But no, it was a mountain lion and I seen his eyes – I seen his eyes and I was freaked out and Mr. Johnson was I see it too. I see it too.

McClellan: You're kidding? Where was I (that?)

Raul: They said don't rush. I was froze. And Mr. Johnson was like go run.

McClellan: You guys must have gone on a different night hike.

Raul: We were behind you all. Everybody was ahead of us we were –it was like a little a move where you see all the people standing and walking and that's how we were and you see this gap and you see me just standing there and all I could see was his red eyes and I'm like oh my gosh. I'm about to die. And Mr. Johnson was like go

McClellan: wow.

Raul: So we also went on a stealth mission I guess you could say in the biosphere after hours. It was like bugs and they have these things called the lungs there and they actually breath. But we didn't know what it actually did after hours so were like in there and thinking we know what we're doing taking pictures, and all of a sudden you hear this boom and like the lungs are breathing and all we heard were these vents and fans come on and we just ran. It was pitch black, you couldn't see nothing. We ran out the door into this windy place and we were all like scared. Mr. McCullough was our chaperone and he was like I honestly didn't know what happened. We were just like, oh my god! The biosphere was fun – it was memories

During the individual interview Student One talked about how he had learned to manage the disease that he is stricken with and had resulted in his confinement to a wheel chair and frequent trips to the hospital when he was younger:

Uh, yeah. I was, I have metabolic myopathy, which is different from most people, because they are different complexes. Mine is complex 4. My body doesn't use or produce ATP or energy in the ways that it should. And so it causes me to have these lapses where I'm in intense pain and its very similar to what they see in like cycle cell anemia patients except it's kind of uncharted territory because most kids with my particular complex deficiency die before the age of 2. And so for me it was a lot of not only just being sick physically but I went through mental health struggles where I was afraid I was going to die every day, so that was a different story for me. So that for me growing up, I had a hard time, just, I was in a wheel chair a lot, cause I was afraid, and not because I absolutely and to be in a wheelchair, but because I was afraid if I used too much energy or anything like that – the lack of understanding everything. And it wasn't because the doctors didn't try to explain it well, they didn't know enough about it, and so, that's pretty much how it was then. I was really sick, I mean, and whether it was mental or physical I just wasn't well. But more than anything it's about taking care of myself, being in shape and things like that so, eating right and having like balanced meals. Make sure I drink enough electrolytes and things like that. It's something I can do for myself and over time I just got better at doing it. It wasn't like a hassle to do It. It just became a lifestyle. And as of lately, I maybe had a hospitalization every three to four months, but I think the last time I was hospitalized was probably 6 or 7 months ago. And before that was five or 6 months.—Garrett

Raul referred to his need to be a positive role model for his younger sister as a reason to focus on his physical well-being:

I'm kind of – this is a tough question. I kind of see myself as a role model to my sister. And that's another reason that I haven't done anything that I consider wrong in life because whatever I might do she might end up doing and that's not a good idea. Monkey see, monkey do. Second I see myself as a way I can – like I said because my mother didn't get to achieve all her goals, everything I do is kind of a way of her also doing.—Raul

Summary

MC Squared's approach to education is supposed to provide the kind of environments that allow students to experience holistic growth towards future leadership in the 21[st]century. Teachers, administrators, and other school personnel who create and work in this school can sense the impact that they are having on the students who are fortunate enough to attend. The students recognize the

growth they are making too. Even the outside personnel that spend any significant

time in the schools that MC Squared is housed in understand that something

different and good is happening in these schools. The analysis of the conceptual

model is composed of understanding academic achievement via motivation, self-

engagement and self-management. Robins et al. (2004) and Lee et al. (1995) as

noted earlier state in their work that these dimensions have been found to

appreciably predict student success. Robbins et al. (2004) through a large scale

meta-analysis studied various components that define academic success. The

analysis of the data collected for this study clearly found that the composite of

psychosocial and academic-related skill predictors were best understood by three

higher order constructs: motivation, academic-related skills, and social

engagement. Robbins et al.'s meta-analysis provides a unified framework for

guiding the development of a comprehensive psychosocial and skills inventory.

Each dimension examined by MC Squared of their students is indicated by at least

one or more measures (i.e., factors). Lastly, it is clear that the balance of these

items measures need to be clearly examined as part of the resilience process these

young people experience during their tenure at MC Squared.

CHAPTER 6: CONCLUSION

Introduction

Students at MC Squared STEM High School are outperforming their peers in other schools on standard academic measures. At the same time, the culture and curriculum of the school is designed to foster both the social/emotional (non-academic) and academic development of its students. Thus, the primary question for this study was: How and in what ways do the non-academic factors of the MC Squared experience contribute to the students' academic success?

To investigate this question, the study was framed, and data collected, on three non-academic determinants for student success: motivation, social engagement, and self-management. (Robbins and Le, 1995, 2004) Using data collected from the students' point of view, I examine and describe how these non-academic determinants contributed to the academic success of five students at MC Squared High School.

Building upon Robbins and Le's (1995, 2004) 3-part conceptual model of non-academic determinants for student success, I propose a multi-faceted conceptual model that, I believe, provides a deeper, more complex understanding of how non-academic determinants help to support and sustain student academic success by positively altering pre-existing peer, family and community relationships and interactions.

The Non-academic Determinant Student Success Triangle

In the world of Science and Engineering an equilateral triangle is the strongest two-dimensional geometric shape. It has the ability to withstand immense load force without deformation.   Each side of an equilateral triangle is the same length and is connected to the others by a pin joint that allows rotation but prevents them from separating. If a load

is applied to any vertex or side, it is evenly distributed by all sides and because the sides

cannot change length, the shape remains stable.

(http://www.reference.com/motif/Science/why-is-the-triangle-the-strongest-shape)

       Much like the internal structural strength of the equilateral triangle, in the field of

education, particularly high school education, maximizing and sustaining student

achievement depends upon three determinants that taken together strengthen and support

one another, and consequently, the whole. These three determinants (Self-Management,

Motivation, and Social Engagement), when present in full capacity and connected to each

other systematically, form the boundaries necessary for maximized sustained academic

achievement. Students who reach their maximum academic potential in a tri-faceted non-

academic academic support system such as MC Squared are able to withstand immense

force without distortion (See Figure 1).

Figure 1: Student Academic Success Triangle
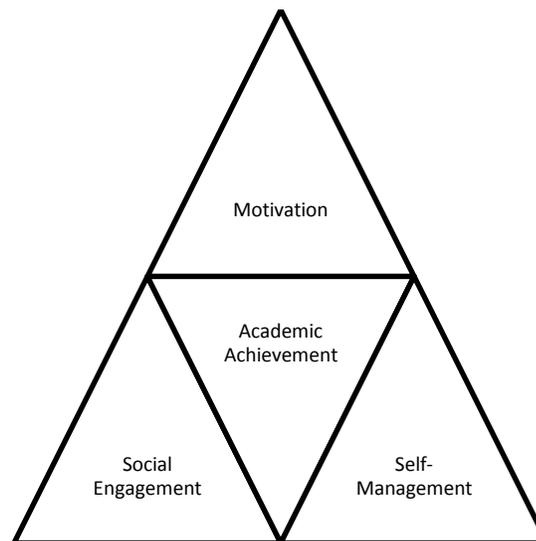
      In the figure above, each internal triangle (determinant) consists of its own

boundary components that are necessary to define the whole construct. This graphic

represents Robbins and Le's conceptual model of how non-academic determinants affect student academic achievement. However, based upon the findings of this study, I propose that there are three additional equally important interactions taking place within each of the three determinants. For a complete picture of how these non-academic factors affect student success, and to better understand how the three determinants support one another, it is necessary to look at how each individual determinant functions internally.

Building upon Robbins and Le's conceptual model of how non-academic determinants contribute to student academic success, I propose a more complex model that takes into consideration unique internal components that comprise each of the individual determinants as they are experienced within the interactive social domains of family, community and peer influence. (See Figure 6.2, the MC Squared Student Success Triangle.)

The MC Squared Student Success Triangle

In Chapter 2, Review of Literature, I discuss how each of the three non-academic determinants consists of other important components. The **Self-Management** determinant is composed equally of: Self-Control, Self-Determination, and Physical Well-Being. The **Motivation** determinant is made up of Conscientiousness, Self-Confidence, and Goal Orientation. And, finally, the **Social Engagement** determinant consists of Teamwork, Social Connectedness, and Social Activity.

If any of the essential components of the three primary determinants is not present then that determinant is compromised. If any one of the three critical determinants is compromised, then so too is the student's potential for maximized and sustained academic achievement.

Embedded within the three non-academic determinants for student success, and their internal components, an analysis of the data in this study revealed three additional social domains that also must be factored into their success: family, community and peers. The effect the MC Squared experience had on these student's social interactions with family, community, and peers was a contributor to their academic achievement. Data from the student interviews revealed that the MC Squared experience had provided a new, more positive perspective from which the students now viewed interpersonal interactions with their communities, peer groups, and families.

As they described their experiences at MC Squared the students often mentioned perceptual changes in their social relationships. For example, they explained how their understanding of how peers, families and communities could support them prior to becoming a student at MC Squared was narrow and limited. They described how their experience at MC Squared had helped them realize that there were other, more positive, ways that families, peers, and communities could support them. Their previous school, community, family, and peer group social support networks sent mixed messages about what was safe and acceptable individual, interpersonal, and school behavior. Before MC Squared, as a result, many had struggled to find a pathway that could advance them to the next level, both personally and academically. Now, preparing to graduate, they realized how their experience at MC Squared had helped them redefine their relationships with each of these social groups in a way that put a higher value on having an identity as a student and as a scholar.

One indicator that this had occurred was how the students described the level of independence they had prior to coming to MC Squared. Upon arrival most felt that they

had individually earned this opportunity and with steely resolve and control were capable of making it on their own. However, for most, an awakening occurred during their early tenure at the school. They realized that to be truly independent, they needed to learn how to let go and become interdependent, in a healthy way, within the community and culture of MC Squared. In this way, the MC Squared experience added opportunities for personal growth in support of the academics. Being a member of the MC Squared community showed them how supportive families, peer groups, and communities can function. They had learned to depend on this new family to grow independently. They realized that they had internalized these new social norms just as they were about to graduate and leave the school. Based upon the findings of this study, Figure 6.2 below depicts a new model for conceptualizing how non-academic factors affect student success.

Figure 2: MC Squared Student Success Triangle
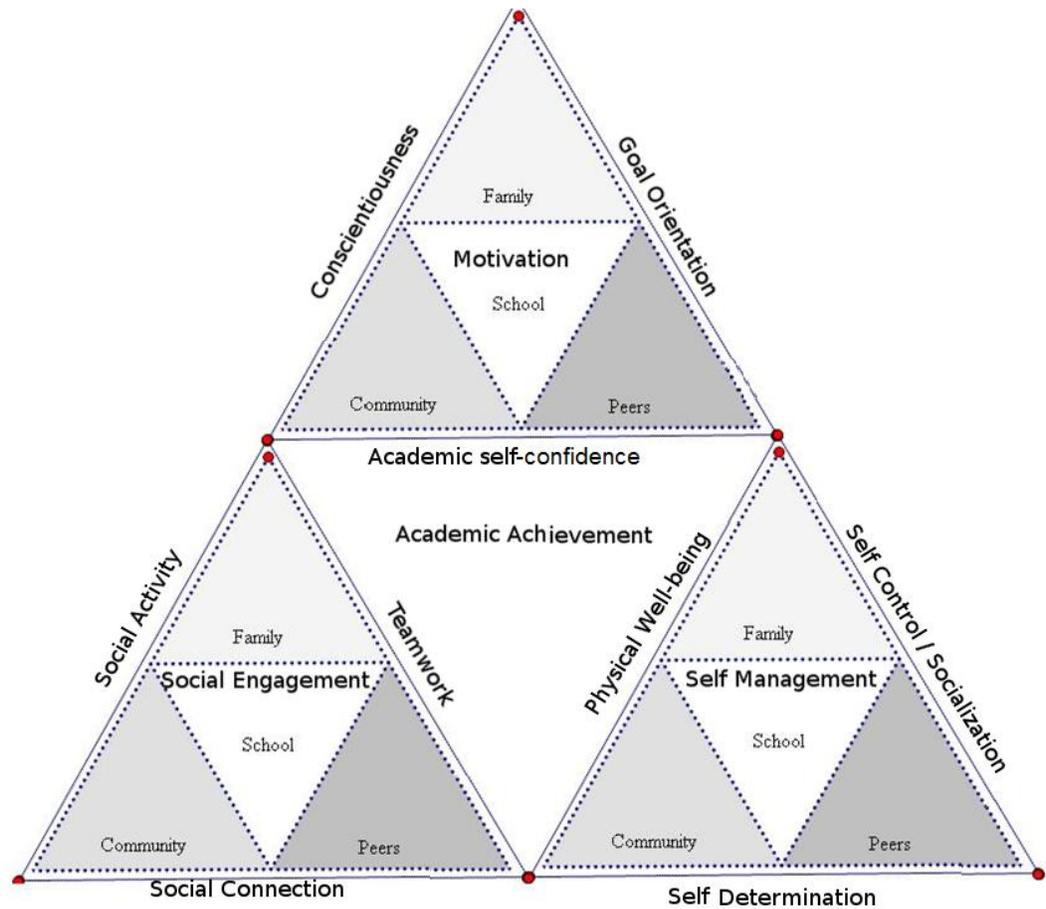
Once the students began attending MC Squared the school provided new social structures and norms for behavior and expectations that allowed them to grow personally while achieving academically. At the same time, the school provided a wide range of new learning experiences, adult and peer connections, and interactive social models that helped them re-interpret their pre-MC Squared perceptions, behaviors, and expectations. They had to un-learn how they previously understood the world and school; and in the process, build new internal identity structures and points of reference. Many found new social support anchors in the MC Squared community, or were able to contextualize their

previous social support systems with new knowledge, thus effectively marginalizing those old behaviors that were not conducive to their success.

Lessons Learned

Three primary lessons were learned as a result of this study. First, the concept of mastery is essential for student growth. Mastery based learning and assessment provides an opportunity for intrinsic motivation and individual control over one's destiny. Second, students thrive in environments that provide opportunities for diversified learning and structural flexibility. The students at MC Squared benefited enormously from their asset of adaptability. Having a flexible and diversified approach was a natural match to their existing assets. The third lesson was that students need acceptance and guidance from the adults around them to redefine themselves within the new world they have entered. MC Squared provides a diverse set of stakeholders to fulfill this role, including teachers, professionals, and community members. Below I discuss each of these lessons in detail.

Lesson One: Mastery Based Learning and Assessment is Essential for Student Academic Growth

   Important Concepts:

- Mastery Based Assessment is an internal trigger of confidence and pride
- Failure breeds success if it occurs in an appropriate framework and is nurtured in the context of future expectations.
- There is a threshold amount of failure that is positive and allows students to learn, as long as that amount does not reach the point of terminal failure

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Building on the "blank" slate is a "position" that seemed to trend among all incoming freshman at MC Squared. It presented itself as students entering a new state of mind to match their new environment. In all instances the old "habits" of self were informally addressed and pushed aside with a commitment to building a new narrative and connection to the "cue" of school, and thus a new routine. The new environment created an internal dialogue in the students' heads which said: starting high is important; at MC Squared High School they will expect me, and I will be required, to achieve at high levels. This new mindset, and its operationalization, allowed students a freedom to learn and grow in an environment in which failure is viewed as only a natural step toward ultimate success. MC Squared challenges students by offering learning opportunities that may result in a level of failure from which they can still learn, but does not allow them to reach the point of terminal failure, or giving up. This balanced approach encourages students to set high academic goals while feeling safe to take academic risks, knowing that they will be supported until they reach high levels of achievement. This mastery based approach to learning and assessment becomes an internal motivational trigger instilling confidence and pride. It also prepares students for academic, personal, and career success beyond MC Squared.

Unlike MC Squared, the model and experience of schooling in most high schools does not match up well with the context of the 21st century work world. Schools need to realign their model to challenge and motivate every student by presenting authentic opportunities to grow and learn the complex skills needed to succeed in today's environment. In the standard methodology for assessing growth, high school students are given a series of traditional assignments and earn a letter grade based on the percentage

of the assignment that was completed correctly. The system design reinforces a need for extrinsic motivation as a pattern. Students enter into this system under the pressure to get the right answer the first time, knowing that they will otherwise be marked down. The approach relies heavily upon students responding to performance goals (Dweck, 1986, and Ames 1992) and contradicts widely accepted best-practice for engaging students in the learning process. It reinforces using external rewards for motivation rather than seeking out or building avenues that increase intrinsic motivation in the student. It is intrinsic motivation that will, in the end, make the student aim higher.

Covington (1992, 1998) argued that one way for students to maintain a sense of self-worth is to protect their sense of academic competence. Covington (1992) discussed strategies that many children adopt to avoid appearing to lack ability. These include procrastination, making excuses, avoiding challenging tasks, and perhaps most important, not trying. It is better not to try rather to risk failure, and lowered self-esteem. Covington & Omelich (1979) call effort as a "double-edged sword," because although trying is important for success (and is encouraged by both teachers and parents), if children try and fail, it is difficult to escape the conclusion that they lack ability. Covington (1992) suggests that reducing the frequency and salience of competitive, social comparative, and evaluative practices, and focusing instead on effort, mastery, and improvement, would allow more children to succeed. However, persistence is required for lasting success.

Several investigations suggest that the power of self-concept to influence self-worth is dependent on the value the person attaches to a particular competence. To maintain their sense of self-worth, many simply reduce the value they attach to a skill or competency at which they expect to fail. However, students who are intrinsically

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motivated to learn expend greater mental effort during instruction, organizing and

rehearsing information, monitoring level of understanding, and relating new material to

prior knowledge (Pinrich & De Groot, 1990). Students who are intrinsically motivated

show persistence when they encounter obstacles. Persistence is important because lasting

learning does not come about through instant gratification. Persistence is the sustaining

component of motivation, and the greater the persistence, the greater the

accomplishments and rewards.

Persistence can be a valid and measurable component of learning. The challenge

of an activity may be concrete or physical like the peak of a mountain to be scaled, or

abstract and symbolic like a set of musical notes to be performed, a story to be written, or

a puzzle to be solved. Having high expectations for achievement from teachers and

adults, challenging tasks, and persistence prepare students to become resilient learners.

Research has shown that the challenges and skill level must be set relatively high before a

"flow experience" becomes possible (Massimini & Carli, 1988). This means providing

the student with a supportive, stimulating, and diversified learning environment.

Lesson Two: Provide Diversified Learning Environments and Program Structural

Flexibility

    Important Concepts:

- Social Anchoring to an adult "authority figure" while the school peer
  group allows for a built-in safety net

- Create a "real world" context for success by experiencing authentic
  interactions and modeling behavior (by adults and peer group)

- Family experience is recreated at MC Squared – reliance on one another

- Safety to explore new challenges in traditionally sealed off venues to expand possibilities for new learning, knowledge, and understanding

- Built in peer-to-peer support – for learning, social support, intervention, peer-to-peer mentoring, and teaching

- Learning how to be dependent to become independent

Diversification of learning venues and experiences and social interactive settings is necessary for persistence and resilience to take root. Trusting and connecting with appropriate role models and supporters creates multiple opportunities for student success. Most arrive at MC Squared without having experienced the range and depth of learning opportunities and social support system offered by MC Squared. Before MC Squared, at best, most perceived school and themselves as independently functioning co-entities albeit with similar missions. This changes as they learn how to work together collaboratively in teams, and depend upon one another to solve real world science and engineering problems. Peer-to-peer support (through project-based learning groups, social support, crisis intervention, peer mentoring, and teaching) helps students help themselves and each other. They realize that real confidence, independence, and success can be achieved more readily by becoming a part of a community of learners.

The sense of family at MC Squared allows students to rely on and support one another in mutually constructive ways. However, this cannot happen without the support of the adults in their lives. In order to have the faith and courage to venture out into these challenging new venues for learning, students must "socially anchor" to an adult authority figure, while their classmates provide a built-in social safety net. Peer interactions are particularly important to social integration because students are more

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likely to stay connected to school when they feel a part of a community with like-minded peers sharing the same purpose and commitment to a common set of goals (Bean 1980; Spady 1970; Tinto 1975, 1987).

The diversity of experiences and flexibility of the school to support students individually in the aforementioned manner provides students an "ecological" context for authentic interactions as behavior is modeled first by adults, and then by their peer group. Thus the school provides a challenging and diversified learning environment (project-based curricular model and socially supportive culture) that fosters both academic achievement and personal growth within the family collective.

Critical to student achievement are learning environments that are viewed by students to be inclusive and affirming, while having high expectations for performance within attainable goals (Education Commission of the States (ECS) 1995; Kuh 2001; Kuh et al. 2005b; Kuh et al. 1991; Pascarella 2001). Typically, teachers are the primary agents for promoting student success and creating a positive school climate and culture. However, as at MC Squared, this kind of environment can be created, and in some cases supplemented, with support from content-area professionals in the field. These may be experts, volunteers, and other adults that interact with and mentor students in field experiences. In a variety of in-school and out of-school venues, MC Squared students were embedded in, and experienced, an "eco-system" of learning that included academic and non-academic factors ranging from project-based peer group interaction and co-mentoring, to classroom and field experiences with teachers and a wide spectrum of practicing science and engineering professionals, internship managers, and external stakeholders. It was this combined social and academic integration, I believe, that led to

a greater commitment and persistence among student's desire to learn, and to go on learning.

MC Squared provides an environment in which students are able to experience a multitude of potentially impactful learning opportunities, and then to internalize the lesson learned through these experiences within a framework of a consistently supportive peer and adult value system. The school provides a normative structure and atmosphere of expectation, socially architecting a new way of life for many of the students. The academic and non-academic eco-system for success provides a wide menu of potential growth opportunities that include: 1) planned "stretch" experiences where students are pushed to extend themselves beyond typical expectations, 2) advanced intellectual criterions of competency within a discipline, 3) a broad and diversified base of caring adults (both within the school and via external stakeholders), 4) experiences with science, technology and mathematics (STEM) professionals wrestling with real life, problem-based learning, and 5) performance and behavioral expectations that are critical to the formation of a scholarly identity.

Supporting the socially and academically diversified learning "eco-system" offered by MC Squared, in their interviews students cited several "highlight-able" events that altered their individual life stories and narratives for the future. These included:

- Interactions with STEM and other professionals in the field
- School teaching staff
- Year–round calendar
- Internships
- Post-Secondary Enrollment Options Program (PSEOP)

- Sophomore Trip to Biosphere 2 in Oracle, Arizona

- Activation Week (Freshman Orientation) and

- Master Your Own Path Program.

All of these learning opportunities provided an environment that helped students form new "habits of the mind" conducive to academic success. In the "habit cycle" (citation) (cue-routine-reward), the cue stayed the same, a new routine replaced an old one, and so was the reward new, based on a new internalized identity structure and set of expectations. The combined effect created a new "habit cycle" that was reinforced by the institutional culture and expectations of MC Squared.

In the end, the MC Squared students who had emerged from this environment were better equipped with the skills and dispositions required to enter these traditionally sealed-off communities of professional practice. By aggressively partnering with technologically-based businesses and institutions, MC Squared students were provided with adult mentoring relationships and internship experiences typically unavailable to high school students, let alone at-risk urban youth (e.g., General Electric Campus, Great Lakes Science Center).

Lesson Three: Provide Unwavering Acceptance of the Student Within a Challenging Yet Supportive Learning Environment

Important Concepts:

- Focus on "Life Purpose," finding meaning defining your role

- "Un-ring" Pavlov's bell through behavioral changes that reinforce new behaviors and norms consistent with meeting high expectations for academic and personal success

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- Achieving self-control and self-mastery – acting upon beliefs and strategies that help to discipline and grow the mind

- Re-frame one's conception of the world to encompass a broader alternative narrative that equally challenging, safe, and worthwhile

Most people tend to frame the world around a workable day-to-day mantra where safety and stability combine to equate a conception of reality that eschews risk-taking. At MC Squared however, students are presented with real, life-changing decisions, and thus assume a modicum of control over their personal and professional destinies. Given peer and adult encouragement and support, students at MC Squared are provided shelter from the harsh realities of their everyday lives to experience what it is like as a typical teenager exploring life's purpose, meaning, and dreaming of a future career. It requires an "un-ringing of Pavlov's Bell" through behavioral changes (i.e. extinction) and reinforcement of new behaviors and norms that support new behavior. This is particularly important to the psychological development of adolescents.

Adolescence is a time of transition. To assist teens navigate this transition, adults need to understand what is happening to adolescents physically, cognitively, and socially. This requires separating the cognitive and social variables that influence individual growth. In Chapter Five, the individual narratives of each of the five students revealed how their cognitive development resulted in the ability to "think about their thinking" (meta-cognition) over the four years.

Acknowledging and respecting adolescent physical and cognitive developmental changes and stages was essential to guiding students as they went through their tenure at MC Squared. Acquiring the ability to self-manage and use prior experiences to guide

decision making was an important part of how the students redefined themselves and rewrote their current and future narratives. They realized and attached to a new family of adult and peer social anchors to lean upon when in doubt and to guide them through daily life challenges.

Learning through a mastery-based system required new habits of mind, behaviors, and self-discipline which developed better strategies for managing behaviors, emotions, and social interactions. MC Squared gave them the opportunity to question and explore the world while being safe, which in turn, redeemed their right to be young and to re-interpret the world from their viewpoint. More importantly, the self-management skills and high expectations of MC Squared experience have taken root to form a new foundation base upon self-care, self-worth, and a real possibility to counter the deficit narrative that has heretofore permeated these students' lives.

<center>Implications for Teaching and Learning</center>

This study's findings of how non-academic determinants affect academic success must be acknowledged at all levels of education. The MC Squared Student Success Triangle approach can be applied both at the micro and macro levels for understanding and implementing educational reform that builds upon student, family, and community involvement in shaping educational policy. This means re-visioning our country's current approach to educational improvement and reform. For example, Linda Darling-Hammond (2010) notes that while federal "No Child Left Behind" legislation has driven national achievement test scores upward, at the same time scores have dropped on international academic achievement measures. It is my belief that utilizing non-academic

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factors to balance non-academic factors will provide the needed balance to create a

system of education well-prepared to meet the challenges of 21st century America.

Conley's (2007) research report, "Redefining College Readiness" focuses on how

we might re-think the operational definition of college readiness, and how this matches

up with the reality of most high school college preparatory programs today. In typical

high schools, little effort is made to go beyond the traditional measures of knowledge

acquisition (courses taken and national achievement tests) when considering how to

prepare the next generation for post-secondary education. Conley argues for a broader

assessment that includes assessing for cognitive interpretive strategies, content

knowledge, and critical academic dispositions to create a more encompassing aptitude for

college admittance.

Much of what Conley proposes aligns with the philosophy and structure of the

MC Squared program. For example, Conley recommends that a culture of intellectual

development be created within an "eco-system" of high expectations, social

connectedness, and a strong bond with teachers. However, providing a diversification of

learning experiences is essential.

<div align="center">Final Reflection</div>

Students can build a community and enhance their self-discovery through the

diversification of their academic and real world experiences. Adherence to the school's

mission, and taking care of kids authentically and within the framework of Branford's

(2000) "How People Learn" model envisions the kind of interdependence most apt to

unleash the potential energy of these students. Non-academic factors are important

elements in an eco-system that provides tolerance and sustains today's challenged

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student. If we provide understanding, individual and community support in context and the transformation will become a normative and expected outcome.

Looking Back

Garrett needed a loving structure to process his talents, and to learn how to use his assets in a beneficial manner. Success occurred largely because the environment allowed for organized chaotic growth. Raul challenged his own assumptions about the world through his classmate's insistence of making him join their worlds -- as a result he stepped out of his comfort zone and built a much higher than expected set of skills for social cognition. Raul has become a scholar of life and of academics.

Mae never caved in, she used her social connectedness and the confidence of others to keep her on the path to accomplish a feat that none in her family had done before her. Mary learned to manage her ego, stop her anger, redirect her sadness and draw on her fear to become a person of confidence and land on her desired trajectory to enter a health profession via a college education.

Ralph dodged one metaphorical bullet after another - not to mention real ones. He was guided by a strong goal orientation and motivation to make a change; he reversed the trend of negative social connections by helping his peers redefine their mission to academic success. Ralph today is in college with four of his friends from school.

Lastly, Angela learned to be who she was instead of what everyone thought she should be. At MC Squared she learned to find her identity and choose the person she wanted to be. While still stumbling through challenges during her senior year, she finished and continues to commit herself to higher education and the dream of one day owning her own home, self-designed.

Further Research

As closure is brought to this study on how non-academic factors have influenced the success of students at MC Squared High School, it is important to let the reader know about further research that I intend to do as a result of this study. My research will focus on three areas:

1. Exploration of how schools are measuring students' levels within the areas of Motivation, Social Engagement, and Self-Management;

2. Replication of this methodology with members of the second class of seniors at MC Squared STEM High School and;

3. Refinement of the Student Success Triangle to more clearly articulate the integrated support system required to ensure maximized, sustained student achievement.

As a practical tool, I can foresee the Success Triangle as the framework for a system to holistically assess students' performance levels within each of the three non-academic areas and track each student's growth as they progress through school and think on.

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REFERENCES

ACT, Inc. (2008). What We Know about College Success: Using ACT Data to Inform Educational Issues. Iowa City, IA: Authors.

Adelman, C. (1999). Answers in the tool box: Academic intensity, attendance patterns, and bachelor's degree attainment. Jessup, MD: U.S. Department of Education, Office of Education Research and Improvement.

Adelman, C. (2006). The Toolbox Revisited: Paths to Degree Completion From High School Through College. U.S. Department of Education. Washington, DC: Office of Vocational and Adult Education.

Alexander, K. L. & Entwisle, D. R. (1996). Schools and children at risk. In A. Booth & J. Dunn (Eds.), *Family-school links: How do they affect educational outcomes?* Mahwah, NJ: Lawrence Erlbaum Associates.

Alexander, K. L., & Entwisle, D. (1988). Achievement in the first two years of school: Patterns and processes. *Monographs of the Society for Research in Child Development*, 53 (2, Serial No. 218).

Alexander, K. L., Dauber, S. L., Entwisle, D. R. (1993). First-grade classroom behavior: Its short- and long-term consequences for school performance. *Child Development*, 64, 801-803.

Alexander, K. L., Entwisle, D. R., & Bedinger, S. D. (1994). When expectations work: Race and socioeconomic differences in school performance." *Social Psychology Quarterly 57,* 283-99.

Alexander, P. A., Kulikowich, J. M., & Jetton, T. L. (1994). The role of subject-matter knowledge and interest in the processing of linear and nonlinear texts. *Review of Educational Research, 64*, 201-252.

Altermatt, E. R., & Pomerantz, E. M. (2003). The development of competence-related and motivational beliefs: An investigation of similarity and influence among friends. *Journal of Educational Psychology*, 95,111-123.

Altrichter, H. (2005), The role of the 'professional community' in action research. *Educational Research Action*, Vol. 13 No. 1, pp. 11-25.

American Association of School Administrators (2006). AASA position statements Position statement 3: Getting children ready for success in school, July 2006; Position statement 18: Providing a safe and nurturing environment for students, July 2007.

Ames, C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology*, 84, 261-271.

Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology*, 80, 260-267.

Anderman, E. M., Austin, C. C., & Johnson, D. M. (2002). The development of goal orientation. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 197-220). San Diego: Academic Press.

Anderman, E. M., Maehr, M. L., & Midgley, C. (1999). Declining motivation after the transition to middle school: Schools can make a difference. *Journal of Research and Development in Education,* 32, 131-147.

Anderman, L. H., & Anderman, E. M. (1999). Social predictors of changes in students' achievement goal orientations. *Contemporary Educational Psychology*, 25, 21-37.

Andrews, G. R., & Debus, R. L. (1978). Persistence and the causal perception of failure: Modifying cognitive attributions. *Journal of Educational Psychology*, 70, 154-166.

Andrews, K., & Edwards, B. (2004). Advocacy organizations in the US political process. *Annual Review of Sociology*, 30, 479-506.

Annis, L. F. (1983). The Processes and Effects of Peer Tutoring. Human Learning, 2: 39-47.

Arbreton, A. J. A., & J. S. Eccles (1994, April). Mother's perceptions of their children during the transition from kindergarten to formal schooling: The effect of teacher evaluations on parents' expectations for their early elementary school children. Paper presented at the annual meeting of the American Educational Research Association Conference, New Orleans, LA.

Arbreton, A. J., Eccles, J. S. & Harold, R. (1994, April). Parents' perceptions of their children's competence: The role of parents attributions. Paper presented at the biennial meeting of the Society for Research on Adolescence, San Diego.

Aronson, J. (2002). Stereotype threat: contending and coping with unnerving expectations. In J. Aronson (Ed.). *Improving academic achievement: Impact of psychological factors on education* (pp. 279-301). San Diego: Academic Press.

Aronson, J. Fried, C.B., & Good, C. (2001). Reducing the effects of stereotype threat on African American college students by shaping theories of intelligence. *Journal of Experimental Social Psychology*,

Aronson, J., & Steele, C. M. (in press). Stereotypes and the fragility of academic competence, motivation, and self-concept. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation.* New York: Guilford.

Arroyo, C, S-Zigler, E. (1995). Racial identity, academic achievement, and the psychological well being of economically disadvantaged adolescents. *Journal of Personality and Social Psychology*, 69, 903-914.

Asher, S. R., & Coie, J. D. (Eds.) (1990). *Peer rejection in childhood.* Cambridge, UK: Cambridge University Press.

Ashida S. & Heaney C. A. (2008). Differential associations of social support and social connectedness with structural features of social network systems and the health status of older adults. *Journal of Aging and Health,* 20(7), 872-893.

Ashton, P. (1985). Motivation and the teacher's sense of efficacy. In C. Ames & R. Ames (Eds.), *Research on motivation in education; Vol. 2. The classroom milieu* (pp. 141-171). Orlando, FL: Academic Press.

Atkinson, J. W. (1957). Motivational determinants of risk taking behavior. *Psychological Review*, 64, 359-372.

Atkinson, J. W. (1964). An introduction to motivation. Princeton, NJ: Van Nostrand.

Babbie, Earl (2001). *The practice of social research (9th ed.).* Belmont: Wadsworth.

Bacon, D.R., Stewart, K.A. and Silver, W.S. (1999). Lessons from the best and worst student team experiences: how can a teacher make the difference.   *Journal of Management Education*, Vol. 23 No. 5, pp. 467-88.

Ball, S. (1995). Enriching student learning through innovative real-life exercises, *Education and Training*, Vol. 37 No. 4, pp. 18-25.

Battle, J., & Lewis, M. (2002). The increasing significance of class: The relative effects of race and socioeconomic status on academic achievement. *Journal of Poverty, 6*(2), 21.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of Human Behavior*, 4. New York: Academic Press, pp. 71-81.

Bandura, A. (1995). Exercise of personal and collective efficacy in changing societies. In A. Bandura (Ed.), *Self-efficacy in changing societies* (pp, 1-45). Cambridge, UK: Cambridge University Press.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: W. H. Freeman.

Bank, B., Slavings, R., and Biddle, R. (1990). Effects of Peer, Faculty, and Parental Influences onStudents' Persistence. Sociology of Education, 63(3): 209-225

Barber B. K., Schluterman J. M. (2008). Connectedness in the lives of children and adolescents: A call for greater conceptual clarity. Journal of Adolescent Health, 43, 209-216.

Barber, B., & Eccles, J. S. (1992). A developmental view of the impact of divorce and single parenting on children and adolescents. *Psychological Bulletin*, 111, 108-126.

Bargh, J., and Schul, Y. (1980). On the Cognitive Benefits of Teaching. Journal of Educational Psychology, 72(5): 593-604.

Baron, R. M., Tom. D. Y. H., & Cooper, H. M. (1985). Social class, race, and teacher expectations. In J. B. Dusek (Ed.), *Teacher expectancies* (pp. 251-269). Hillsdale, NJ: Erlbaum.

Barton, P. E. (2007). What about those who don't go? *Educational Leadership*. 64, 26-27.

Barrows, H. S. (1996). Problem-based learning in medicine and beyond. In L. Wilkerson & W. H. Gijselaers (Eds.). Bringing problem-based learning to higher education: Theory and practice. *New directions in teaching and learning* (Vol. 68, pp. 3–12). San Francisco: Jossey-Bass.

Basch C. (2010). Healthier Students Are Better Learners: A Missing Link in School Reforms to Close the Achievement Gap. *Equity Matters*: Research Review No. 6. New York: Columbia University; 2010.

Battin-Pearson, S. R., Thornberry, T. P., Hawkins, J. D., & Krohn, M. D. (1998). *Gang membership, delinquent peers, and delinquent behavior.* (Rep. No. 1-11). Washington DC: U. S. Department of Justice.

Battle, A., & Wigfield, A. (2003). College women's value orientations toward family, career, and graduate school. *Journal of Vocational Behavior*, 62, 56-75.

Battle, J., & Lewis, M. (2002). The increasing significance of class: The relative effects of race and socioeconomic status on academic achievement. [Article]. *Journal of Poverty, 6*(2), 21.

Baumeister, R.F. & Leary, M.R. (1995). The need to belong. Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117, 497-529.

Baumert, J. (1995, April). Gender, science interest, teaching strategies and socially shared beliefs about gender roles in 7th graders - a multi-level analysis. Paper presented at the annual meeting of the American Educational Research Association, San Francisco.

Baxter, P. & Jack, S (2008). Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers. *The Qualitative Report Volume 13 Number* 4 544-559

Bean, J. P. (1983). The Application of a Model of Turnover in Work Organizations to the Student Attrition Process. The Review of Higher Education, 6(2): 129-148.

Bean, J. P. (1980). Dropouts and Turnover: The Synthesis and Test of a Causal Model of Student Attrition. Research in Higher Education, 12(2): 155-187.

Benders, Huijgen, & Pekruhl (2002). What do we know about the incidence of group work(if anything?)? *Personnel Review*, 31(3): 371-85.

Benware, C., and Deci, E. (1984). Quality of Learning With an Active Versus Passive Motivational Set. American Educational Research Journal, 21(4): 755-765.

Birch, S. H., & Ladd, G. W. (1996). Interpersonal relationships in the school environment and children's early school adjustment: The role of teachers and peers. In J. Juvonen & K. R. Wentzel (Eds.), *Social motivation: Understanding children's school adjustment* (pp. 199-225). New York: Cambridge University Press.

Blum, R. M., & Libbey, H. P. (2004). Executive summary: School connectedness— strengthening health and education outcomes for teenagers. *Journal of School Health, 74*, 231–232.

Blumenfeld, P. C. (1992). Classroom learning and motivation: Clarifying and expanding goal theory. *Journal of Educational Psychology*, 84, 272-281.

Boekaerts, M., Pintrich, P. R., & Zeidner, M. (2000). *Handbook of self-regulation.* San Diego: Academic Press.

Bong, M. (2001). Role of self-efficacy and task value in predicting college students' course enrollments and intentions. *Contemporary Educational Psychology*, 26, 553-570.

Bong, M., & Clark, R. E. (1999). Comparison between self-concept and self-efficacy in academic motivation research. *Educational Psychologist*, 34, 139-154.

Bonny, A. E., Britto, M. T., Klostermann, B. K., Hornung, R. W., & Slap, G. B. (2000). School disconnectedness: Identifying adolescents at risk. *Pediatrics, 106,* 1017-1021.

Borkowski, J. G., Weyhing, R. S., & Carr, M. (1988). Effects of attributional retraining on strategy-based reading comprehension in learning-disabled student. *Journal of Educational Psychology*, 80, 46-53.

Bourdieu, P. 1986. 'The Forms of Capital.' Pp. 241-58 in *Handbook of theory and research for the sociology of education*, edited by John G Richardson. New York: Greenwood Press.

Brand, S., Felner, R., Shim, M., Seitsinger, A., & Dumas, T. (2003). Middle school improvement and reform: Development and validation of a school-level assessment of climate, cultural pluralism, and school safety. *Journal of Educational Psychology*, 95, 570-588.

Brannen, Julia (1992). *Mixing methods: qualitative and quantitative research*. Aldershot, England: Avebury.

Brewer, J., & Hunter, A. (1989). *Multimethod research: A synthesis of styles.* Newbury Park, NJ: Sage.

Bridglall, B. L., and Gordon, E. W. (2002). The Idea of Supplementary Education. Pedagogical Inquiry and Praxis (No. 3). New York: Teachers College, Columbia University, Institute for Urban and Minority Education

Bronfenbrenner, U., & Morris, P. A. (1998). The ecology of environmental processes. In W. Damon (Series Ed.) & R. M. Lerner (Vol. Ed.), *Handbook of child psychology* (5th ed., Vol. 1, pp. 993-1028). New York: Wiley.

Bronfenbrenner, U. (1986). Ecology of the family as a context for human development: Research perspectives. *Developmental Psychology, 22*(6), 723-742.

Bronfenbrenner, U., & Crouter, A.C. (1982). Work and family through time and space. In S.B. Kamerman & C.D. Hayes (Eds.), Families tbat work: Children in a changing world (pp. 39-83). Washington, DC: National Academy Press.

Brooks-Gunn, J, Guo, G., & Furstenberg, F. F. Jr. (1993). Who drops out of and who continues beyond high school? A 20-year follow up of black urban youth. *Journal of Research on Adolescence*, 3, 271-294.

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Brophy, J. E. (1985). Teacher-student interaction. In J. B. Dusek (Ed.), Teacher expectations (pp. 303-328). Hillsdale, NJ: Erlbaum.

Brophy, J. E. (2004). *Motivating students to learn (2nd Ed.).* Mahwah, NJ: Erlbaum.

Brown, B. B. (1990). Peer groups and peer culture. In S. S. Feldman and G. R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 171-196). Cambridge, MA: Harvard University Press.

Brown, B. B. (2004). Adolescents' relationships with peers. In R. M. Lerner & L. D. Steinberg (Eds.), *Handbook of adolescent psychology* (2nd Ed., pp. 363-394). New York: Wiley.

Bryk, A. S., Lee, V. E., Holland, P.B. (1993). *Catholic schools and the common good.* Cambridge, MA: Harvard University Press.

Bryman, Alan (2004). *Social research methods (2nd ed.).* New York: Oxford University Press.

Bullock, M., & Lutkenhaus, P. (1988). The development of volitional behaviors in the toddler years. *Child Development*, 59, 664-674.

Burhans, K. K., & Dweck, C. S. (1995). Helplessness in early childhood: The role of contingent worth. *Child Development*, 66, 1719-1738.

Butler, R. (1993). Effects of task- and ego-achievement goals on information seeking during task engagement. *Journal of Personality and Social Psychology*, 65, 18-31.

Cameron, J., & Pierce, W. D. (1994). Reinforcement, reward, and intrinsic motivation: A meta-analysis. *Review of Educational Research*, 64, 363-424.

Carcia Coll, C., T., Crnic, K., Hamerty, G., Wasik, B. H., Jenkins, R., Vazquez Garcia, H., & McAdoo, H. P. (1996). An integrative model for the study of developmental competencies in minority children. *Child Development*, 20,1891-1914.

Carlson D., Haveman, Kaplan, and Wolfe (2008). Long-term effects of public low-income housing vouchers on work, earnings, and neighborhood quality. Institute for Research on Poverty Discussion Paper No. 1338-08. July.

Carnegie Council on Adolescent Development (1989). *Turning points: Preparing American youth for the 21st century.* Washington, DC.

Center for Disease Control and Prevention (2010) (http://www.cdc.gov/pcd/issues/2010/jul/09_0176.htm) Putting Physical Activity Where It Fits in the School Day: Preliminary Results of the ABC (Activity Bursts in the Classroom) for Fitness Program Volume 7: No. 4, July 2010

Centers for Disease Control and Prevention. (2003). Behavioral risk factor surveillance system. http://www.cdc.gov/brfss/

Chen, A., Darst, P. W. & Pangrazi, R. P. (2001). An examination of situational interest and its sources. *British Journal of Educational Psychology*, 71, 383-400.

Chirkov, V., Ryan, R.M., Kim, Y., & Kaplan, U. (2003). Differentiating autonomy from individualism and independence: A Self-Determination Theory perspective on internalization of cultural orientations and well-being. *Journal of Personality and Social Psychology*, 84, 97-110.

Christakis, NA; Fowler, JH (2008). Quitting in Droves: Collective Dynamics of Smoking Behavior in a Large Social Network (PDF). *New England Journal of Medicine* 358 (21): 2249–2258.

Clark, R. (1983). *Family life and school achievement: Why poor black children succeed or fail.* Chicago: University of Chicago Press.

Clark, R. (1993). Homework parenting practices that positively affect student achievement. In N. F. Chavkin (Ed.), *Families and schools in a pluralistic society* (pp. 53–71). Albany: State University of New York Press.

Clinebell, S. and Stecher, M. (2003). Teaching teams to be teams: an exercise using the Myer- Briggs type indicator and the five-factors personality traits. *Journal of Management Education*, Vol. 27 No. 3, pp. 362-83.

Cohen, J. (2001). Social and emotional education: Core principles and practices. In J. Cohen(ed.). Caring classrooms/intelligent schools: The social emotional education of young children. New York: Teachers College Press. [Online]. Available URL: www.csee.net/resources/selbook

Cohen, L., & Manion, L. (1994). *Research methods in education. (4th ed.)* London: Routledge.

Cohen, L., Manion, L. and Morrison, K. R. B. (2000) *A Guide to Teaching Practice (fifth edition).* London: Routledge.

Cohen, S., & Syme, S. L. (1985). *Social support and health.* Orlando, Fla.: Academic Press.

Coleman, J. S. (1987). The relation between school and social structure. In M. T. Hallinan (Ed.), *The social organization of schools: New conceptualisation of the learning process* (pp. 177–204). New York: Plenum.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*(supplement), S95-S120. doi: 10.1086/228943

Collins, Jim (2001). *Good to Great*. New York. HarperCollins.

Collins, W. A., Maccoby, E. E., Steinberg, L., Hetherington, E. M., & Bornstein, M. H. (2000). Contemporary research on parenting. The case for nature and nurture. *American Psychologist*, 55, 218-32.

Conger, R. D., Wallace, E., Lora, Sun, Yumei, Brody, G., McLoyd, V., Simons, R.L. and Peris, L. (2002). Economic pressure in African-American families: A replication and extension of the family stress model. *Developmental Psychology*, 38, 179-193.

Conley, D. T. (2007). Redefining college readiness. Eugene, OR: Educational Policy Improvement Center.

Connell, J. P. (1985). A new multidimensional measure of children's perception of control. *Child Development,* 56, 1018-1041.

Connell, J. P., & Wellborn, J. G. (1991). Competence, autonomy, and relatedness: A motivational analysis of self-system processes. In R. Gunnar & L. A. Sroufe (Eds.), *Minnesota symposia on child psychology* (Vol. 23, pp. 43-77). Hillsale, NJ: Lawrence Erlbaum Associates.

Connell, J. P., Halpern-Felsher, B. L., Clifford, E., Crichlow, W., & Usinger, P. (1995). Hanging in there: Behavioral, psychological, and contextual factors affecting whether African-American adolescents stay in high school. *Journal of Adolescent Research*, 10, 41-63.

Connell, J. P., Spencer, M. B., & Aber, J. L. (1994). Educational risk and resilience in African American Youth: Context, self, and action outcomes in school. *Child Development, 65,* 493-506.

Cook, T. D., Church, M. B., Ajanaku, S., Shadish, W. R., Kim, J. R., & Cohen, R. (1996). The development of occupational aspirations and expectations among inner-city boys. *Child Development*, 67, 3368-3385.

Cooley-Strickland, M., Quille, T.J., Griffin, R.S., Stuart, E.A., Bradshaw, C.P., & Furr Holden, D. (2009). Community violence and youth: Affect, behavior, substance use, and academics. *Clinical Child Family Psychology Rev*, 12, 127-156.

Cooper, H., & Dorr, N. (1995). Race comparisons on need for achievement: A meta-analytic

Cordova, D. I., & Lepper, M. R. (1996). Intrinsic motivation and the process of learning: Beneficial effects of contextualization, personalization, and choice. *Journal of Educational Psychology,* 88, 715-730.

Corno, L. (1993). The best-laid plans: Modern conceptions of volition and educational research. Educational Researcher, 22, 14-22.

Corno, L. (in press). *Work habits and study styles: Volition in education*. Teachers College Press.

Corno, L., & Kanfer, R. (1993). The role of volition in learning and performance. In L. Darling-Hammond (Ed.), *Review of research in education (Vol. 29).* Washington, DC: American Educational Research Association.

Corwyn, R. F. & Bradley, R. F. (2003). Family process mediators of the relation between SES and child outcomes. Unpublished manuscript, University of Arkansas at Little Rock.

Council of the Great City Schools, (1992). *National urban education goals: Baseline indicators, 1990-91*. Washington, DC: Council of the Great City Schools.

Covington, M. V., & Omelich, C. L. (1979). Effort: the Double-Edged Sword in School *Achievement Journal of Educational Psychology*, 71(2), 169-182.

Covington, M. V. (1992). *Making the grade: a self-worth perspective on motivation and school reform.* Cambridge: Cambridge University Press.

Covington, M. V. (1998). *The will to learn: a guide for motivating young people.* Cambridge, U.K.: Cambridge University Press.

Covington, M. V., & Dray, E. (2002). The developmental course of achievement motivation: A need-based approach. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 33-56). San Diego: Academic Press.

Cox, P. L., & Bobrowski, P. E. (2000). The team charter assignment: Im- proving the effectiveness of classroom teams. *The Journal of Behavioral and Applied Management. 1(1),* 92–103.

Crandall, V. C., Katkovsky, W., & Crandall, V. J. (1965). Children's beliefs in their own control of reinforcements in intellectual-academic achievement situations. *Child Development*, 36, 91-109

Cresswell 1998, p. 4 Cresswell, J. W. (1998) *Qualitative Inquiry and Research Design: Choosing among the Five Traditions.* Thousand Oaks, CA: Sage.

Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research. (3rd ed.).* Upper Saddle Creek, NJ: Pearson Education.

Creswell, J.W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches. (2nd ed.)* Thousand Oaks: Sage.

Cronan, T. A., Groessl, E., & Kaplan, R. M. (1997). The effects of social support and education interventions on health care costs. *Arthritis Care & Research, 10(2),* 99-110.

Crystal, D. S., & Stevenson, H. W. (1991). Mothers' perceptions of children's problems with mathematics: A cross-national comparison. *Journal of Educational Psychology*, 83, 372-376.

Csikszentmihalyi, M. (1988). The flow experience and its significance for human psychology. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience* (pp. 15-35). Cambridge, MA: Cambridge University Press.

Csikszentmihalyi, M., & Massimini, F. (1985). On the psychological selection of bio-cultural information. *New Ideas in Psychology*, 3, 15-38.

Csikszentmihalyi, M., Rathunde, K., & Whalen, S, (1993). *Talented teenagers: The roots of success and failure.* New York: Cambridge University Press.

Csikszentmihalyi, M., & Schneider, B. (2000). *Becoming adult: How teenagers prepare for the world of work*. New York: Basic Books.

Daly, B., Buchanan, C., Dasch, K., Eichen, D., & Lenhart, C. (2010) Promoting school connectedness among urban youth of color: Reducing risk factors while promoting protective factors. *The Prevention Researcher,* 17, 18-21.

Darling-Hammond, L. (1997). *The right to learn: A blueprint for creating schools that work.* San Francisco: Jossey-Bass.

Davis-Kean, P. E. & Eccles, J. S. (2003). Influences and barriers to better parent-school collaborations. *The LSS Review*, 2 (1), 4-5.

Davis-Kean, P. E. & Eccles, J. S. (2003). Influences and barriers to better parent-school collaborations. *The LSS Review*, 2 (1), 4-5.

Davis-Kean, P. E. & Magnuson, K. A. (2004). The importance of parents' education on child outcomes. Unpublished manuscript.

Davis-Kean, P. E. (in press). The influence of parent education and family income on child achievement: The indirect role of parental expectations and the home environment. *The Journal of Family Psychology.*

Davis-Kean, P. E., Eccles, J. S. & Schnabel, K. U. (August, 2002). How the home environment socializes a child: The influence of SES on child outcomes. Paper presented at the International Society for the Study of Behavioral Development, Ottawa, Canada.

Davis-Kean, P. E., Malanchuk, O., Peck, S. C., & Eccles, J. S. (2003). Parental influence on academic outcomes: do race and SES matter? *Paper presented at the Biennial Meeting of the Society for Research on Child Development*, Tampa, FL.

DeBaryshe, B. D., Patterson, G. R., & Capaldi, D. M. (1993). A performance model for academic achievement in early adolescence. *Developmental Psychology*, 29, 795-804.

De Civita, M., & Pagani, L. (1996). Familial constraints on the initiation of cigarette smoking among adolescents: An elaboration of social bonding theory and differential association theory. *Canadian Journal of School Psychology, 12,* 177–190.

Deci, E. L. (1992). The relation of interest to the motivation of behavior: A self-determination theory perspective. In K. A. Renninger, S. Hidi, & A. Krapp (Eds.), *The role of interest in learning and development* (pp. 43-70). Hillsdale, NJ: Erlbaum.

Deci, E. L. (1998). The relation to interest to motivation and human needs: The self-determination theory viewpoint. In. L. Hoffman, A. Krapp, K. A. Renninger, & J. Baumert (Eds.), *Interest and learning* (pp. 146-162). Kiel, Germany: IPN Press

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior.* New York: Plenum Press.

Deci, E. L., & Ryan, R. M. (2002a). Self-determination research: Reflections and future directions. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination theory research* (pp. 431-441). Rochester, NY: University of Rochester Press.

Deci, E. L., & Ryan, R. M. (2002b). The paradox of achievement: The harder you push, the worse it gets. In J. Aronson (Ed.), *Improving academic achievement: Impact of psychological factors on education* (pp. 61-87). San Diego: Academic Press.

Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic motivation on intrinsic rewards. *Psychological Bulletin*, 125,627-668.

Deci, E., L., Vallerand, R. J., Pelletier, L. C., & Ryan, R. M. (1991). Motivation and education: The self-determination perspective. *Educational Psychologist, 26,* 325-346.

Deeter, T. E. (1990). Remodeling expectancy and value in physical activity. *Journal of Sport and Exercise Psychology,* 12, 83-91.

Denny, D. R. (1980). Self-control approaches to the treatment of test anxiety. In I. G. Sarason (Ed.), *Test anxiety: Theory, research, and applications.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Dewey, J. (1913). *Interest and effort in education.* Boston: Riverside Press.

Deyhle, D., & LeCompte, M. (1999). Cultural differences in child development: Navaho adolescents in middle schools. In R. H. Sheets and E. R. Hollins (Eds.), *Racial and ethnic identity in school practices: Aspects of human development,* (pp. 123-140). Mahwah, NJ: Lawrence Erlbaum Associates.

Dornbusch, S. M. (1994). *Off the track. Presidential address at the biennial meeting of the Society for Research on Adolescence*, San Diego, CA.

Dornbusch, S.M. Erickson, K. G. Laird, J. & Wong, C.A. (2001). The Relation of Family and School Attachment to Adolescent Deviance in Diverse Groups and Communities. Journal of Adolescent Research, Vol. 16, No. 4, 396-422

Dotterer, A. M., McHale, S. M., & Crouter, A. C. (2007). Implications of out-of-school activities for school engagement in African American adolescents. *Journal of Youth and Adolescence, 36(4),* 391-401.

Dowson, M., & McInerney, D. M. (2003). What do students say about their motivational goals? Towards a more complex and dynamic perspective on student motivation. *Contemporary Educational Psychology*, 28, 91-113.

Dreeban, R., & Barr, R. (1988). Classroom composition and the design of instruction. *Sociology of Education*, 61, 129-142.

Dryfoos, J. G. (1990). *Adolescents at risk: Prevalence and prevention*. Oxford: Oxford University Press.

Duncan, G. J., Brooks-Gunn, J., & Klevbanov, P. K. (1994). Economic deprivation and early childhood development. *Child Development*, 65, 296-318.

Dunkle M., Nash M. (1991). *Beyond the Health Room*. Washington, DC: Council of Chief State School Officers, Resource Center on Educational Equity; 1991.

DuFour, Richard, Eaker, Robert (1988). *Professional Learning Communities as Work Best Practices for Enhancing Student Achievement*. Bloomington, IN. National Education Service.

Dusek, J. B. (1980). The development of test anxiety in children. In I. G. Sarason (Ed.), *Test anxiety: Theory, research, and applications*. Hillsdale, NJ: Erlbaum.

Dweck, C. S. (1975). The role of expectations and attributions in the alleviation of learned helplessness. *Journal of Personality and Social Psychology*, 31, 674-685.

Dweck, Carol S. (1986). Motivational processes affecting learning. *American Psychologist*, Vol 41(10), Oct 1986, 1040-1048.

Dweck, C. S. (2002). The development of ability conceptions. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 57-88). San Diego: Academic Press.

Dweck, C. S., & Elliott, E. S. (1983). Achievement motivation. In P. H. Mussen (Ed.), *Handbook of child psychology* (Vol. IV, 3rd. Ed., pp. 643-691). New York: Wiley.

Dweck, C. S., & Goetz, T. E. (1978). Attributions and learned helplessness. In J. H. Harvey, W. Ickes, & R. F. Kidd (Eds.), *New directions in attribution research* (Vol. 2, pp. 155-179). Hillsdale, NJ: Erlbaum.

Dweck, C. S., & Leggett, E. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, 95, 256-273.

Dweck, C. (1999). *Self-Theories: Their Role in Motivation, Personality, and Development.* Philadelphia: Psychol. Press

Dweck, C. S., & Lennon, C. (2001). Person vs. process focused parenting: Impact on achievement motivation. Paper presented at the biennial meeting of the Society for Research in Child Development, Minneapolis.

Dweck, C. S., & Licht, B. G. (1980). Learned helplessness and intellectual achievement. In J. Garber & M. E. P. Seligman (Eds.), *Human helplessness: Theory and applications*. New York: Academic Press.

Eaton, M. J. & Dembo, M.H. (1997). Differences in the motivational beliefs of Asian American and Non-Asian students. *Journal of Educational Psychology,* 89, 433-440.

Eccles (Parsons), J., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., & Midgley, C. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motivation* (pp.75-146). San Francisco, CA.: W. H. Freeman.

Eccles, J. S. & Harold, R. D. (1991). Gender differences in sport involvement: Applying the Eccles' expectancy-value model. *Journal of Applied Sport Psychology*, 3, 7-35.

Eccles, J. S. (1984). Sex differences in achievement patterns. In T. Sonderegger (Ed.), *Nebraska Symposium on Motivation (Vol. 32, pp. 97-132)*. Lincoln, NE: University of Nebraska Press.

Eccles, J. S. (1987). Gender roles and women's achievement-related decisions. *Psychology of Women Quarterly*, 11, 135-172.

Eccles, J. S. (1989). Bringing young women to math and science. In M. Crawford and M. Gentry (Eds.), *Gender and thought: Psychological perspectives* (pp. 36-57). New York: Springer-Verlag.

Eccles, J. S. (1994). Understanding women's educational and occupational choices: Applying the Eccles et al. model of achievement-related choices. *Psychology of Women Quarterly*, 18, 585-609.

Eccles, J. S. (1998). Commentary: Individual differences and the development of perceived control. *Monographs of the Society for Research in Child Development* (Serial No. 254, Vol. 6, No.2-3, pp. 221-231).

Eccles, J. S. (2004). Schools, academic motivation, and stage-environment fit. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (2nd ed., pp. 125-153). New York: John Wiley and sons.

Eccles, J. S., & Barber, B. L. (1999). Student council, volunteering, basketball, or marching band: What kind of extracurricular involvement matters? *Journal of Adolescent Research,* 14, 10-43.

Eccles, J. S., & Harold, R. D. (1992). Gender differences in educational and occupational patterns among the gifted. In N. Colangelo, S. G. Assouline, & D. L. Amronson (Eds.), *Talent Development: Proceedings form the 1991 Henry B. and Jocelyn Wallace National Research Symposium on Talent Development.* Unionville, NY: Trillium Press (pp. 3-29).

Eccles, J. S., & Harold, R. D. (1993). Parent-school involvement during the early adolescent years. *Teachers' College Record,* 94, 568-587.

Eccles, J. S., & Midgley, C. (1989). Stage/environment fit: Developmentally appropriate classrooms for early adolescents. In R. Ames & C. Ames (Eds.), *Research on motivation in education* (Vol. 3, pp. 139-181). New York: Academic Press.

Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology,* 53, 109-132.

Eccles, J. S., & Wigfield, A. (1985). Teacher expectations and student motivation. In J. B. Dusek (Ed.), *Teacher expectations* (pp. 185-217). Hillsdale, NJ: Lawrence Erlbaum Associates.

Eccles, J. S., & Wigfield, A. (1995). In the mind of the achiever: The structure of adolescents' academic achievement related-beliefs and self-perceptions. *Personality and Social Psychology Bulletin*, 21, 215-225.

Eccles, J. S., (1993). School and family effects on the ontogeny of children's interests, self-perceptions, and activity choice. In J. Jacobs (Ed.) Nebraska *Symposium on Motivation, 1992: Developmental perspectives on motivation.* (pp. 145- 208) Lincoln, NB: University of Nebraska Press.

Eccles, J. S., Freedman-Doan, C., & Yoon, K. (2000). *Gender-role socialization in the family: a longitudinal approach.* In T. Eckes & H. M. Trautner (Eds), The developmental social psychology of gender. Mahwah, NJ, Lawrence Erlbaum Associates 333-360.

Eccles & Gootman. Eds. (2002). Community programs to promote youth development. Washington, DC: National Academy Press.

Eccles, J. S., Midgley, C., Wigfield, A., Reuman, D., Mac Iver, D., & Feldlaufer, H. (1993). Negative effects of traditional middle-schools on students' motivation. *Elementary School Journal*, 93, 553- 574.

Eccles, J. S., Wigfield, A., & Schiefele, U. (1998). Motivation to succeed. In W. Damon (Series Ed.) & N. Eisenberg (Volume Ed*.) Handbook of child psychology (5th ed., Vol. III, pp. 1017-1095).* New York: Wiley

Eccles, J. S., Wigfield, A., Flanagan, C., Miller, C., Reuman, D., & Yee, D. (1989). Self-concepts, domain values, and self-esteem: Relations and changes at early adolescence. *Journal of Personality*, 57, 283-310.

Eccles, J. S., Wigfield, A., Harold, R., & Blumenfeld, P. B. (1993). Age and gender differences in children's self- and task perceptions during elementary school. *Child Development*, 64, 830-847.

Education Commission of the States (ECS). (1995). Making Quality Count in Undergraduate Education. Denver, CO: ECS Distribution Center.

Elder, G. H., Eccles, J. S., Ardelt, M., & Lord, S. (1995). Inner-city parents under economic pressure: Perspectives on the strategies of parenting. *Journal of Marriage and the Family, 6,* 81-86.

Elliot, A. J., McGregor, H. A., & Gable, S. (1999). Achievement goals, study strategies, and exam performance: A mediational analysis. *Journal of Educational Psychology, 91,* 549–563.

Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist*, 34, 169-189.

Elliot, A. J., & Harackiewicz, J. M. (1996). *Approach and avoidance goals and intrinsic motivation: A mediational analysis. Journal of Personality and Social Psychology*, 70, 461-475.

Elliot, A.J., & Harackiewicz, J.M. (1996). Goal setting, achievement orientation and intrinsic motivation: A mediational analysis. *Journal of Personality and Social Psychology,* 66, 968–980.

Elliot, A. J., & McGregor, H. (2001). A 2 x 2 achievement goal framework. *Journal of Personality and Social Psychology*, 80, 501-509.

Elliot, A. J., Chirkov, V.I., Kim, Y., & Sheldon, K.M. (2001). A cross-cultural analysis of avoidance (relative to approach) personal goals. *Psychological Science, 6,* 505-510.

Elliot, A. J., Dweck, C. S. (Eds.). (in press). *Handbook of competence and motivation.* New York: Guilford.

Entwisle, D. R., & Alexander, K. L. (1990). Beginning school math competence: Minority and majority comparisons. *Child Development*, 61, 454-471.

Entwisle, D. R., & Alexander, K. L. (1993). Entry into school: The beginning school transition and educational stratification in the United States. *Annual Review of Sociology,* 19, 401-423.

Entwisle, D. R., & Alexander, K. L. (1999). Early schooling and social stratification. In R. C. Pianta & M. J. Cox (Eds.), *The transition to kindergarten* (pp. 13-38). Baltimore: P. H. Brookes Publishing.

Entwisle, D. R., & Alexander, K. L. (2000). Diversity in family structure: Effects on schooling. In D. H. Demo, K. R. Allen & M. A. Fine (Eds.), *Handbook of family diversity.* (pp. 316-337).

Faules, D. (1982). The use of multi-methods in the organizational setting. *Western Journal of Speech Communication,* 46, 150-161.

Feather, N. T. (1982). Expectancy - value approaches: Present status and future directions. In N. T. Feather (Ed.), *Expectations and actions: Expectancy-value models in psychology* (pp. 395-420). Hillsdale, NJ: Erlbaum.

Feather, N. T. (1988). Values, valences, and course enrollment: Testing the role of personal values within an expectancy - value framework. *Journal of Educational Psychology*, 80, 381-391.

Feather, N. T. (1992). Values, valences, expectations, and actions. *Journal of Social Issues,* 48, 109-124.

Fellenz, M.R. (2006). "Towards fairness in assessing student group work: a protocol for peer evaluation of individual contributions". *Journal of Management Education.* Vol. 30 No. 4, pp. 570-91.

Felner, R. D., Jackson, A. W., Kasak, D., Mulhall, P., Brand, S., & Flowers, N. (1997). The impact of school reform for the middle years: Longitudinal study of a network engaged in Turning Points-based comprehensive school transformation. *Phi Delta Kappan*,78, 528-532; 541-550.

Ferguson, R. F. (1998). Teachers' perceptions and expectations and the Black-White test score gap. In C. Jencks & M Phillips (Eds.), *The Black-White test score gap.* (pp.273- 317). Washington, D. C.: Brookings Institute Press.

Fine, M. (1991). *Framing dropouts: Notes on the politics of an urban public high school.* Albany: State University of New York Press.

Finn, J. D. (1989). Withdrawing from school. *Review of Educational Research*, 59, 117-142.

Fiqueira-McDonough, J. (1986). School context, gender, and delinquency. *Journal of Youth and Adolescence*, 15, 79-98.

Ford, M. E. (1992). *Human motivation: Goals, emotions, and personal agency beliefs.* Newbury Park, CA: Sage.

Forsterling, F. (1985). Attributional retraining: A review. *Psychological Bulletin*, 98, 495-512.

Fraenkel, J. R., & Wallen, N. E. (2003). *How to design and evaluate research in education (5th ed.).* Boston, MA: McGraw-Hill.

Fredericks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, 74, 59 – 109.

Fredericks, J., & Eccles, J. S. (2002). Children's competence and value beliefs from childhood through adolescence: Growth trajectories in two male sex-typed domains. *Developmental Psychology*, 38, 519-533.

Friedman, Thomas L. (2006) *The World is Flat a Brief History of the Twenty-First Century.* New York. Farrar, Straus, and Giroux.

French, R. and Vince, R. (1999), Group Relations, Management and Organization, Oxford University Press, Oxford.

Frome, P. M. & Eccles, J. S. (1998). Parents' influence on children's achievement-related perceptions. *Journal of Personality and Social Psychology*, 74(2) 435-452.

Frome, P., & Eccles J. (1995, April). Underestimation of academic ability in the middle school Years. Based on poster presented at the SRCD, Indianapolis, IN.

Fuligni, A. J., & Eccles, J. S. (1993). Perceived parent-child relationships and early adolescents' orientation towards peers. *Developmental Psychology*, 29, 622-632.

Fuligni, A. J., & Tseng, V. (1999). Family obligation and the academic motivation of adolescents from immigrant and American-born families. In T. Urdan (Ed.), *Advances in motivation and achievement, Volume 11: The role of context* (pp. 159-183). Stamford, CT: JAI Press.

Fuligni, A. J., Eccles, J. S., Barber, B. L. (1995). *The long-term effects of seventh-grade ability grouping in mathematics.* Journal of Early Adolescence, 15, 58-89.

Furlong, A., Cartmel, F., Biggart, A., Sweeting, H. & West, P. (2003). *Youth transitions: Patterns of vulnerability and processes of social inclusion.* Edinburgh: Scottish Executive Social Research.

Furlong, M. J., Whipple, A. D., St. Jean, G., Simental, J., Soliz, A., & Punthuna, S. (2003). Multiple contexts of school engagement: Moving toward a unifying framework for educational research and practice. *California School Psychologist*, 8, 99–114.

Furrer, C., & Skinner, E. (2003). Sense of relatedness as a factor in children's academic engagement and performance. *Journal of Educational Psychology*, 95, 148-162.

Furstenberg, F., Cook, T., Eccles, J., Elder, G., & Sameroff, A. (1999). *Managing to make it: Urban families in adolescent success.* Chicago: University of Chicago Press.

Galper, A., Wigfield, A., & Seefeldt, C. (1997). Head Start parents' beliefs about their children's abilities, task values, and performance on different activities. *Child Development*, 68, 897-907.

Garcia Coll, C., & Pachter, L. M. (2002). Ethnic and minority parenting. In M. Bornstein (Ed.), *Handbook of parenting (2nd Ed., Vol. 4).* Mahwah, NJ: Erlbaum.

Garcia, T., & Pintrich, P. R. (1994). Regulating motivation and cognition in the classroom: The role of self-schemas and self-regulatory strategies. In D. H. Schunk and B. J. Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and educational applications* (pp. 127-154). Hillsdale, NJ: Lawrence Erlbaum Associates.

Gardner, Howard. 1999 The Unschooled Mind. New York: Simon and Schuster.

Gibson, C. B., & Gibbs, J. L. 2006. Unpacking the concept of virtuality: The effects of geographic dispersion, electronic dependence, dynamic structure, and national diversity on team innovation. *Administrative Science Quarterly,* 51(3): 451-495.

Gladieux, Lawrence E., and Swail, Watson S. (1998). "Postsecondary Education: Student Success, Not Just Access." In S. Halperin (ed.) The Forgotten Half Revisited. Washington, DC: American Youth Policy Forum.

Goodnow, C. (1993). Classroom belonging among early adolescent students: Relationships to motivation and achievement. *Journal of Early Adolescence*, 13(1), 21-43.

Goodnow, J. J., & Collins, W. A. (1990). *Development according to parents: The nature, sources, and consequences of parents' ideas.* London: Erlbaum.

Goldschmid, B., and Goldscmid, M. (1976). Peer Teaching in Higher Education: A Review. Higher Education, 4(1): 9-33.

Gottfried, A. E. (1990). Academic intrinsic motivation in young elementary school children. *Journal of Educational Psychology*, 82, 525-538.

Gottfried, A. E., (1985). Academic intrinsic motivation in elementary and junior high school students. *Journal of Educational Psychology*, 77(6), 631-645.

Gottfried, A. E., Fleming, J. S., & Gottfried, A. W. (2001). Continuity of academic intrinsic motivation from childhood through late adolescence: A longitudinal study. *Journal of Educational Psychology*, 93, 3-13.

Graham, S. (1991). A review of attribution theory in achievement contexts. *Educational Psychology Review*, 3, 5-38.

Graham, S. (1992). Most of the subjects were European American and middle class: Trends in published research on African Americans in selected APA journals 1970-1989. *American Psychologist*, 47, 629-639.

Graham, S. (1994). Motivation in African Americans. *Review of Educational Research*, 64, 55-117.

Graham, S., & Barker, G. (1990). The downside of help: An attributional-developmental analysis of helping behavior as a low ability cue. *Journal of Educational Psychology*, 82, 7-14.

Graham, S., & Golan, S. (1991). Motivational influences on cognition: Task involvement, ego involvement, and depth of information processing. *Journal of Educational Psychology*, 83, 187-194.

Graham, S., & Taylor, A. Z. (2002). Ethnicity, gender, and the development of achievement values. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 123-146). San Diego: Academic Press.

Graham, S., Taylor, A. Z. & Hudley, C. (1998). Exploring achievement values among ethnic minority early adolescents. *Journal of Educational Psychology*, 90, 606-620.

Grant, H. & Dweck, C.S. (2001). Cross-cultural responses to failure: Considering outcome attributions with different goals. In F. Salili, C.Y. Chui, & Y.Y. Hong (Eds.), *Student motivation: The culture and context of learning* (pp. 203-219), New York: Plenum.

Greeno, J. G., Collins, A.M., Resnick, L.B. (1996). Cognition and learning. In D.C. Berliner & R.C. Calfee (Eds.), *Handbook of educational psychology* (pp. 15-46). London, England: Prentice Hall International.

Grolnick, W. S., & Ryan, R. M. (1987). Autonomy in children's learning: An experimental and individual difference investigation. *Journal of Personality & Social Psychology*, 52, 890-898.

Grolnick, W. S., & Ryan, R. M. (1989). Parent styles associated with children's self-regulation and competence in schools. *Journal of Educational Psychology, 8*, 143-154.

Grolnick, W. S., & Slowiaczek, M. L. (1994). Parents' involvement in children's schooling: A multidimensional conceptualization and motivational model. *Child Development*, 65, 237-252.

Grolnick, W. S., Gurland, S. T., Jacob, K. F., & Decourcey, W. (2002). The development of self-determination in middle childhood and adolescence. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 147-171). San Diego: Academic Press.

Grotevant, H. D., & Cooper, C. R. (1998). Individuality and connectedness in adolescent development: Review and prospects for research on identity, relationships, and context. In E. Skoe, E. Aspaas, & A. L. Von der Lippe (Eds.), *Personality development in adolescence: A cross national and life span perspective* (pp. 3–37). New York: Routledge.

Guay, F., Boivin, M., & Hodges, E.V. E. (1999). Predicting change in academic achievement: A model of peer experiences and self-system processes. *Journal of Educational Psychology*, 91, 105-115.

Guay, F., Marsh, H. W., & Boivin, M. (2003). Academic self-concept and academic achievement: Developmental perspectives on their causal ordering. *Journal of Educational Psychology*, 95, 124-136.

Gurin P., and Epps, E. (1975). Black Consciousness, Identity, and Achievement: A Study of Students in Historically Black Colleges. New York: John Wiley & Sons.

Guthrie, J. T., Wigfield, A., & Perencevich, K. (Eds.) (2004). *Motivating reading comprehension: Concept Oriented Reading Instruction.* Mahwah, NJ: Lawrence Erlbaum Associates.

Guthrie, J. T., Wigfield, A., Barbosa, P., Perencevich, K. C., Taboada, A., Davis, M. H., Scafiddi, N., & Tonks, S. (2004). Increasing reading comprehension and engagement through Concept Oriented Reading Instruction. *Journal of Educational Psychology*, 96, 403-423.

Gutman, L. M., Sameroff, A. J., & Eccles, J. S., (2002). The academic achievement of African American students during early adolescence: An examination of multiple risk, promotive, and protective factors. *American Journal of Community Psychology*, 30, 367 –399.

Gutman, L., & Midgley, C. (2000). The role of protective factors in supporting the academic achievement of poor African American students during the middle school transition. *Journal of Youth and Adolescence*, 29, 223-248.

Halpern, David. 2005. *Social Capital*. Cambridge, UK ; Malden, MA: Polity.

Hammond, L. (2010). *The flat world and education: how America's commitment to equity will determine our future*. New York: Teachers College Press.

Harackiewicz, J. M., Baron, K. E., Pintrich, P. R., Elliot, A. J., & Thrash, T. M. (2002). Revision of achievement goal theory: Necessary and illuminating. Journal of *Educational Psychology*, 94, 638-645.

Harackiewicz, J.M., Barron, K.E., & Elliot, A.J. (1998). Rethinking achievement goals: When are they adaptive for college students and why? *Educational Psychologist*, 33, 1-21.

Hare, B. R. (1985). Stability and change in self-perceptions and achievement among African American adolescents: A longitudinal study. *Journal of African American Psychology*, 11, 29-42.

Harter, S. (1981). A new self-report scale of intrinsic versus extrinsic orientation in the classroom: Motivational and informational components. *Developmental Psychology*, 17, 300-312.

Harter, S. (1982). The Perceived Competence Scale for Children. *Child Development*, 53, 87-97.

Harter, S. (1990). Causes, correlates and the functional role of global self-worth: A life-span perspective. In J. Kolligian & R. Sternberg (Eds.), *Perceptions of competence and incompetence across the life-span* (pp. 67-98). New Haven, CT: Yale University Press.

Harter, S. (1998). The development of self-representations. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology* (Vol. 3, 5th Ed., pp. 553-617). New York: John Wiley and Sons.

Harter, S., Whitesell, N. R., & Kowalski, P. (1992). Individual differences in the effects of educational transitions on young adolescents' perceptions of competence and motivational orientation. *American Educational Research Journal*, 29, 809-835

Hawkley, L. C., Browne, M. W., & Cacioppo, J. T. (2005). How can I connect with thee Let me count the ways. *Psychological Science, 16*, 798-804

Healthy People 2020 Report, http://www.healthypeople.gov/2020/default.aspx

Hearn, J. C. (1987). Impacts of Undergraduate Experiences on Aspirations and Plans for Graduate and Professional Education. Research in Higher Education, 27(2): 119-141.

Heckhausen, H. (1977). Achievement motivation and its constructs: A cognitive model. *Motivation and Emotion*, 1, 283-329.

Heckhausen, H. (1987). Emotional components of action: Their ontogeny as reflected in achievement behavior. In D. Gîrlitz & J. F. Wohlwill (Eds.), Curiosity, imagination, and play. Hillsdale, NJ: Erlbaum.

Hedelin, L. & Sjîberg, L. (1989). The development of interests in the Swedish comprehensive school. *European Journal of Psychology of Education*, 4, 17-35.

Heine, S.J., Lehman, D.R., Ide, E., Leung, C. Kitayama, S., Takata, T., & Matsumoto, H. (2001).   Divergent consequences of success and failure in Japan and North America: An investigation of self-improving motivations and malleable selves. *Journal of Personality and Social Psychology*, 81, 599-615.

Hendry, L. B., & Reid, M. (2000). Social relationships and health: The meaning of social "connected- ness" and how it relates to health concerns for rural Scottish adolescents. *Journal of Adolescence, 23(6),* 705–719.

Hess, R. D., Chih-Mei, & McDevitt, T. M. (1987). Cultural variations in family beliefs about children's performance in mathematics: Comparisons among People's Republic of China, Chinese-American, and Caucasian-American families. *Journal of Educational Psychology*, 70, 179-188.

Heyman, G. D., Dweck, C. S., & Cain, K. M. (1993). Young children's vulnerability to self-blame and helplessness: Relationships to beliefs about goodness. *Child Development*, 63, 401-415.

Heywood, J. (2000). *Assessment in Higher Education: Student Learning, Teaching, Programmes and Institutions.* Jessica Kingsley Publishers (HEPS 56), London, Philadelphia, PA.

Hickey, D.T. & McCaslin, M. (2001). A comparative, sociocultural analysis of context and motivation. In S. Volet & S. Jarvela, (Eds), *Motivation in learning contexts: Theoretical advances and methodological implications* (pp. 33-55). Elmsford, NY: Pergamon Press, Inc.

Hidi, S. (1990). Interest and its contribution as a mental resource for learning. *Review of Educational Research*, 60, 549-571.

Hidi, S., & Harackiewicz, J. (2000). Motivating the academically unmotivated: A critical issue for the 21st Century. *Review of Educational Research*, 70, 151-180.

Hill, K. T., & Sarason, S. B. (1966). The relation of test anxiety and defensiveness to test and school performance over the elementary school years: A further longitudinal study. *Monographs for the Society for Research in Child Development*, 31 (2, Serial No. 104).

Hill, K. T., & Wigfield, A. (1984). Test anxiety: A major educational problem and what to do about it. *Elementary School Journal,* 85, 105-126.

Hill, L.G. & Werner, N.E. (2006). Affinitive Motivation, School Attachment, and Aggression in School. *Psychology in the Schools*. 43 (2)

Hmelo-Silver, C. E., Duncan, R. G., and Chinn, C. A. (2007). Scaffolding and Achievement in Problem-based and Inquiry Learning: A Response to Kirschner, Sweller, and Clark (2006). *Educational Psychologist,* 2007, *42,* 99–107.

Hodgkinson-Williams, C., Stay, H. and Sieborger, I. (2008). "Developing communities of practice within and outside higher education institutions". *British Journal of Educational Technology*, Vol. 39 No. 3, pp. 433-42.

Hoffmann, L., & Haeussler. (April 18 - 22, 1995). Modification of interests by instruction. Paper presented at Annual AERA Meeting in San Francisco, CA.

Hokoda, A., & Fincham, F. D. (1995). Origins of children's helpless and mastery achievement patterns in the family. *Journal of Educational Psychology*, 87, 375-385.

Holland, A., & Andre, T. (1987). Participation in extracurricular activities in secondary school: What is known, what needs to be known? *Review of Educational Research*, 57, 437-466.

Holloway, S. D. (1988). Concepts of ability and effort in Japan and the United States. *Review of Educational Research*, 58, 327-345.

Holtham, C. W., Melville, R. R., & Sodhi, M. S. (2006). Designing student group work in management education: Widening the palette of options. *Journal of Management Education, 30,* 809–817.

Horn, L., and L.K Kojaku (2001). High School Academic Curriculum and the Persistence Path Through College: Persistence and Transfer Behavior of Undergraduates 3 Years After Entering 4-Year Institutions. *NCES Quarterly*, Vol. 3, Issue 3.

Hunt, J. M., & Paraskevopoulos, J. (1980). Children's psychological development as a function of the inaccuracy of their mothers' knowledge of their abilities. *Journal of Genetic Psychology*, 136, 285-298.

Husman, J. (1998). The effects of perceptions of the future on intrinsic motivation. Unpublished doctoral dissertation, University of Texas at Austin.

Husman, J., & Lens, W. (1999). The role of the future in the study of motivation. *Educational Psychologist*, 34,113-125

Huston, A. C., McLoyd, V., & Coll, C. G. (1994). Children and poverty: Issues in contemporary research. *Child Development*, 65, 275-282.

Jackson, A. W., & Davis, G. A. (2000). *Turning points 2000: Educating adolescents in the 21st century*. New York: Teachers College Press.

Jacobs, J. E. (1992). The influence of gender stereotypes on parent and child math attitudes. *Journal of Educational Psychology*, 83, 518-527.

Jacobs, J. E., & Eccles, J. S. (1992). The influence of parent stereotypes on parent and child ability beliefs in three domains. *Journal of Personality and Social Psychology*, 63, 932-944.

Jacobs, J. E., & Eccles, J. S. (2000). Parents, task values, and real-life achievement-related choices. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 405-439). San Diego: Academic Press.

Jacobs, J., Davis-Kean, P. E., Bleeker, M., Eccles, J. S., & Malanchuk, O. (2004). "I can do it but I don't want to." The impact of parents, interests, and activities on gender differences in math. In A. Gallagher & J. Kaufman (Eds.), *Gender differences in mathematics*. New York: Cambridge University Press.

Jacobs, J., Lanza, S., Osgood, D. W., Eccles, J. S., & Wigfield, A. (2002). Ontogeny of children's self-beliefs: Gender and domain differences across grades one through 12. *Child Development*, 73, 509-527.

James, W. (1892/1963). Psychology. New York: Fawcett.

Jencks, C. L., & Brown, M. (1975). *The effects of high schools on their students.* Harvard Educational Review, 45, 273-324.

Jennings, G. (2003). An exploration of meaningful participation and caring relationships as contexts for school engagement. *The California School Psychologist, 8,* 43-52.

Jennings, K. D. (1991). Early development of mastery motivation and its relation to the self-concept. In M. Bullock (Ed.), The development of intentional action. *Cognitive, motivational, and interactive processes (Vol. 22, Contributions to human development).* Basel: Karger Press.

Jessor, R., &:Jessor, S. L. (1977). *Problem behavior and psychosocial development: A longitudinal study of youth.* Orlando, FL: Academic Press.

Johnson, M. D., Hollenbeck, J. R., Humphrey, S. E., Ilgen, D. R., Jundt, D., & Meyer, C. J. 2006. Cutthroat cooperation: Asymmetrical adaptation to changes in team reward structures. *Academy of Management Journal,* 49: 103-119.

Jussim, L., Eccles, J., & Madon, S. (1996). Social perception, social stereotypes, and teacher expectations: Accuracy and the quest for the powerful self-fulfilling prophecy. In L. Berkowitz (Ed.) *Advances in Experimental Social Psychology* (pp. 281-388). New York: Academic Press.

Juvonen, J., & Graham, S. (Eds.) (2001). *Peer harassment in school: The plight of the vulnerable and victimized.* New York: Guilford Press.

Juvonen, J., & Wentzel, K. R. (Eds.) (1996). *Social motivation: Understanding children's school adjustment.* New York: Cambridge University Press.

Juvonen, J., Le, V. N., Kaganoff, T., Augustine, C., & Constant, L. (2004). *Focus on the wonder years: Challenges facing the American middle school.* Santa Monica, CA: Rand Corporation.

Juvonen, J., Nishnia, A., & Graham, S. (2001). Self-views and peer perceptions of victim status among early adolescents. In J. Juvonen & S. Graham (Eds.), *Peer*

harassment in school: The plight of the vulnerable and victimized (pp. 105-124). New York: Guilford Press.

Kahn, R. L. and C. F. Cannell (1957). The Psychological Basis of the Interview. The *Dynamics of Interviewing: Theory, Technique, and Cases.* New York, John Wiley & Sons: 22-64.

Kao, G, & Thompson, J.S. (2003). Racial and ethnic stratification in educational achievement and attainment. *Annual Review of Sociology*, 29, 417-442.

Kaplan, A., & Middleton, M. (2002). Should childhood be a journey or a race? Response to Harackiewicz et al. (2002). *Journal of Educational Psychology*, 94, 646-48.

Karcher, M. J. (2001). *Measuring adolescent connectedness: Four validation studies.* Poster session presented at the annual meeting of the American Psychological Association, San Francisco.

Karcher, M. J. (2002). The cycle of violence and disconnection among rural middle school students: Teacher disconnection as a consequence of violence. *The Journal of School Violence, 1(1),* 35-51.

Kember, D. (2009). Promoting student-centered forms of learning across an entire university. *Higher Education*, 58, 1–13.

Kindermann, T. A. (1993). Natural peer groups as contexts for individual development: The case of children's motivation in school. *Developmental Psychology*, 29, 970-977.

Kindermann, T. A., McCollam, T. L., & Gibbson, E. Jr. (1996). In peer networks and students' classroom engagement during childhood and adolescence. In K. Wentzel, & J. Juvonen (Eds.), *Social motivation: Understanding children's school adjustment.* Cambridge University Press.

Kirkman, B. L., & Rosen, B. 1999. Beyond self-management: Antecedents and consequences of team empowerment. *Academy of Management Journal,* 42: 58-74.

Kitsantas, A., Zimmerman, B. J., & Cleary, T. (2000). The role of observation and emulation in the development of athletic self-regulation. *Journal of Educational Psychology*, 92, 811-817.

Knight, R. (1981). Parents' beliefs about cognitive development: The role of experience. In A. R. Nesdale, C. Pratt, R. Grieve, J. Field, D. Illingworth, & J. Hogben (Eds.), *Advances in child development: Theory and research* (pp. 226-229). Perth: University of Western Australia Press.

Kohlberg, L. (1966). A cognitive-development analysis of children's sex-role concepts and attitudes. In E. E. Maccoby (Ed.), *The Development of sex differences* (pp. 81-72). Stanford: Stanford University Press.

Kohn, M. L. (1997). *Class and conformity: A study in values, with a reassessment.* Chicago: University of Chicago Press.

Kopp, C. B. (1991). Young children's progression to self-regulation. In M. Bullock (Ed.), The development of intentional action. *Cognitive, motivational, and interactive processes (Vol. 22, Contributions to human development).* Basel: Karger Press.

Krapp, A., Hidi, S. & Renninger, K. A. (1992). Interest, learning and development. In K. A. Renninger, S. Hidi & A. Krapp (Eds.), *The role of interest in learning and development* (pp. 3-25). Hillsdale, NJ: Erlbaum.

Krippendorff, Klaus (2004). *Content analysis: An introduction to its methodology (2nd ed.).* Thousand Oaks: Sage.

Krueger, Richard A. 1988. *Focus Groups: A Practical Guide for Applied Research.* Newbury Park, Calif.: Sage Publications.

Krueger, Richard A. 1998. *Analyzing and Reporting Focus Group Results. Focus Group Kit 6.* Thousand Oaks, Calif.: Sage Publications.

Kuh, G. D. (2001). Assessing What Really Matters to Student Learning: Inside the National Survey of Student Engagement. Change, 33(3): 10-17, 66.

Kuh, G. D. (2005). Student Engagement in the First Year of College. In Challenging and Supporting the First-Year Student: A Handbook for Improving the First Year of College, edited by M. L. Upcraft, J. N. Gardner, and B. O. Barefoot, 86-107. San Francisco: Jossey-Bass.

Kuh, G. D., Schuh, J. H., Whitt, E. J., Andreas, R., Lyons, J., Strange, C. C., Krehbiel, L. E., and MacKay, K. A. (1991). Involving Colleges: Successful Approaches to Fostering Student Learning and Development Outside the Classroom. San Francisco: Jossey-Bass Publishers.

Kuh, G. D., and Lund, J. P. (1994). What Students Gain From Participating in Student Government. New Directions for Student Services, (66): 5-17.

Kuhl, J. (1987). Action control: The maintenance of motivational states. In F. Halisch & J. Kuhl (Eds.), *Motivation, intention, and volition* (pp. 279-307). Berlin: Springer-Verlag.

Kuhl, J. (2000). A functional design approach to motivation and self-regulation: The dynamics of personality systems and interactions. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 111-169). San Diego: Academic Press.

Kuhl, J., & Kraska, K. (1989). Self-regulation and metamotivation: Computational mechanisms, development, and assessment. In R. Kanfer, P. L. Ackerman, & R. Cudeck (Eds.), *Abilities, motivation, and methodology*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Kulik, J. A., & Kulik, C. L. (1987). Effects of ability grouping on student achievement. *Equity & Excellence*, 23, 22-30.

Kulik, J., Kulik, C., and Cohen, P. (1980). Effectiveness of Computer-Based College Teaching: A Meta-Analysis of Findings. Review of Educational Research, 50 (4): 525-544

Kunkel, S.W. (2002). Consultant learning: a model for student directed learning. *Management Education*, Vol. 26 No. 2, pp. 121-38.

Lafromboise, T. Coleman, H.L.K., & Gerton, J. (1993). Psychological impact of biculturalism. Evidence and theory. *Psychological Bulletin*, 114, 395-412.

Lammers, W. J., & Murphy, J. J. (2002). A profile of teaching techniques used in the university classroom. *Active Learning in Higher Education*, 3, 54–67.

Larson, R., & Richards, M. H. (1991). Daily companionship in late childhood and early adolescence: Changing developmental contexts. *Child Development*, 62, 284-300.

Lave, J. and Wenger, E. (1991). Situated Learning: Legitimate Peripheral Participation, Cambridge University Press. New York, NY.

Le, H., Casillas, A., Robbins, S., & Langley, R. (2005). Motivational and skills, social, and self-management predictors of college outcomes: Constructing the Student Readiness Inventory. *Educational and Psychological Measurement, 65,* 482–508.

Lee, S.J. (1994). Beyond the model-minority stereotype: Voices of high- and low-achieving Asian American students. *Anthropology & Education Quarterly*, 25, 413-429.

Lee, V. E. & Smith, J. (2001). *Restructuring high schools for equity and excellence: What works*. New York: Teachers College Press.

Lee, V. E., & Bryk, A.S. (1989). A multilevel model of the social distribution of high school achievement. *Sociology of Education*, 62, 172-192.

Lee, V.E. & Croninger, R.G. (1994). The Relative Importance of Home and School in Development of Literacy Skills for Middle-Grade Students. *American Journal of Education*, 102 (3), 286-329.

Lens, W. (1986). Future time perspective: A cognitive-motivational construct. In D. R. Brown & J. Veroff (Eds.), *Frontiers of motivational psychology* (pp. 173-190). New York: Springer-Verlag.

Lepper, M. R. & Chabay, R. W. (1985). Intrinsic motivation and instruction: Conflicting views on the role of motivational processes in computer-based education. *Educational Psychologist*, 20, 217-230.

Lepper, M. R. & Green, D. (1978). *The hidden cost of rewards: New perspectives on the psychology of human motivation*. Hillsdale, NJ: Erlbaum.

Lepper, M. R., & Henderlong, J. (2000). Turning "play" into "work": 25 years of research on intrinsic versus extrinsic motivation. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 257-307). San Diego: Academic Press.

Libbey, H. P. (2004). Measuring student relationships to school: Attachment, bonding, connectedness, and engagement. *Journal of School Health, 74*, 274–283.

Linver, M.R., Brooks-Gunn, J., & Kohen, D.E. (2002). Family processes as pathways from income to young children's development. *Developmental Psychology*, 38, 719-734.

Lipsitz, J., Mizell, M. H., Jackson, A. W., & Austin, L. M. (1997). Speaking with one voice: A manifesto for middle-grades reform. *Phi Delta Kappan*, 78, 533-540.

Lord, S., Eccles, J. S., & McCarthy, K. (1994). Risk and protective factors in the transition to junior high school. *Journal of Early Adolescence*, 14, 162-199.

Luster, T., Rhoades, K. & Hass, B. (1989) The relation between parental values and parenting behavior: A test of the Kohn hypothesis. *Journal of Marriage and the Family*, 51, 139-147.

Lynch, M., & Cicchetti, D. (1997). Children's relationships with adults and peers: An examination of elementary and junior high school students. *Journal of School Psychology*, 35(1), 81-99.

Mac Iver, D. (1987). Classroom factors and student characteristics predicting students' use of achievement standards during ability self-assessment. *Child Development*, 58, 1258-1271.

Mac Iver, D. J., & Epstein, J. L. (1993). Middle grades research: Not yet mature, but no longer a child. *Elementary School Journal*, 93, 519-533.

Mac Iver, D. J., & Plank, J. B. (1997). Improving urban schools: Developing the talents of students placed at risk. In J. L. Irvin (Ed.), *What current research says to the middle level practitioner* (pp. 243-256). Columbus, OH: National Middle School Association.

Mac Iver, D. J., Reuman, D. A., & Main, S. R. (1995). Social structuring of school: Studying what is, illuminating what could be. In M. R. Rosenzweig & L. W. Porter (Eds.), *Annual review of psychology* (Vol. 46).

Mac Iver, D. J., Stipek, D. J., & Daniels, D. H. (1991). Explaining within-semester changes in student effort in junior high school and senior high school courses. *Journal of Educational Psychology*, 83, 201-211.

Mac Iver, D. J., Young, E. M., & Washburn, B. (2002). Instructional practices and motivation during middle school (with special attention to science). In A. Wigfield & J. S. Eccles (Eds.), *The development of achievement motivation* (pp. 333-351). San Diego: Academic Press.

Maehr, M. L., & Midgley, C. (1996). *Transforming school cultures*. Boulder, CO: Westview Press.

Mahoney, J. L., & Cairns, R. B. (1997). Do extracurricular activities protect against early school dropout? *Developmental Psychology*, 33, 2414-253.

Malmberg, Lars-Erik (2005). Goal-orientation and teacher motivation among teacher applicants and student teachers. *Teaching & Teacher Education*, 22, 1, 58-76.

Mantzicopoulos, P., French, B. F., & Maller, S. J. (2004). Factor structure of the Pictorial Scale of Perceived Competence and Social Acceptance with two pre-elementary samples. *Child Development*, 75, 1214-1228.

Marjoribanks, K. (2002). Family and school capital: Towards a context theory of students' school outcomes. Dordrecht, The Netherlands: Kluwer Academic.

Markus, H. R., & Wurf, E. (1987). The dynamic self-concept: A social psychological perspective. *Annual Review of Psychology*, 38, 299-337.

Markus, H., R., & Nurius, P. (1986). Possible selves. *American Psychologist*, 41, 954-969.

Markus. H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 224-253.

Marsh, H. W. (1989). Age and sex effects in multiple dimensions of self-concept: Preadolescence to early adulthood. *Journal of Educational Psychology*, 81, 417-430.

Marsh, H. W. (1990a). A multidimensional, hierarchical self-concept: Theoretical and empirical justification. *Educational Psychology Review*, 2, 77-171.

Marsh, H. W. (1990b). The causal ordering of academic self-concept and academic achievement: A multiwave, longitudinal analysis. *Journal of Educational Psychology*, 82.

Marsh, H. W., & Ayotte, V. (2003). Do multiple dimensions of self-concept become more differentiated with age: The differential distinctiveness hypothesis. *Journal of Educational Psychology*, 95, 687-706.

Marsh, H. W., & Yeung, A. S. (1997). Causal effects of academic self-concept on academic achievement: Structural equation models of longitudinal data. *Journal of Educational Psychology*, 89, 41-54.

Marsh, H. W., Ellis, L. A., & Craven, R. G. (2002). How do preschool children feel about themselves? Unraveling measurement and multidimensional self-concept structure. *Developmental Psychology*, 38, 376-393.

Marshall, C., & Rossman, G. (2006). *Doing qualitative research (4th ed.).* London: Sage.

Martin, R., Drew, K., Gaddis, L., & Moseley, M. (1988). Prediction of elementary school achievement from preschool temperament; Three studies. *School Psychology Review*, 17 (pp. 125-137).

Martinez, M., and Klopott, S. (2003). *Improving College Access for Minority, Low-Income, and First-Generation Students*. Boston: Pathways to College Network.

Massimini, F. & Carli, M. (1988). The systematic assessment of flow in daily experience. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), Optimal experience: *Psychological studies of flow in consciousness* (pp. 266-287). Cambridge, MA: Cambridge University Press.

Mathiasen, R. E. (1984). Predicting college academic achievement: Aresearch review. *College Student Journal, 18,* 380–386.

Mathieu, J. E., & Schulze, W. 2006. The influence of team knowledge and formal plans on episodic team process-performance relationships. *Academy of Management Journal,* 49: 605-619.

Matsumoto, D. & Sanders, M. (1988). Emotional experiences during engagement in intrinsically and extrinsically motivated tasks. *Motivation and Emotion*, 12, 353-369.

Matute-Bianchi, M.E. (1986). Ethnic identities and patterns of school success and failure among Mexican-descent and Japanese-American students in a California high school: An ethnographic analysis. *American Journal of Education*, 95, 233-255.

McCall, R. B., Evahn. C. & Kratzer, L. (1992). *High school underachievers: What do they achieve as adult*s? Newbury Park, CA: Sage Publications.

McGillicuddy-De Lisi, A., & De Lisi, R. (2002). Emergent themes in the development of sex differences in cognition. In A. McGillicuddy-De Lisi & R. De Lisi (Eds.), Biology, society, and behavior: The development of sex differences in cognition (*Advances in Applied Developmental Psychology*, 21, 243-258). Westport, CT: Ablex Publishing.

McGillicuddy-DeLisi, A. V., & Sigel, I. E. (1991). Family environments and children's representational thinking. In (Eds.) *Advances in reading/language research. Vol. 5* (pp. 63-90). JAI Press.

McInerney, D. M., & Van Etten, S. (2004). Big theories revisited: The challenge. In D. M. McInerney & S. Van Etten (Eds.), *Big theories revisited (Vol. 4: Research on sociocultural influences on motivation and learning*, pp. 1-13). Greenwich, CT: Information Age Press.

McInerney, D. M., Hinkley, J., Dowson, M., & Van Etten, S. (1998). Aboriginal, Anglo, and immigrant Australian students' motivational beliefs about personal academic success: Are there cultural differences? *Journal of Educational Psychology*, 90, 621-629.

McKillip, J. (1987). Need Analysis: Tools for the Human Service and Education. *Applied SocialResearch Methods Series, Volume 10*. Sage Publications: Thousand Oaks, CA.

McLloyd, V. C. (1990). The impact of economic hardship on African American families and children: Psychological distress, parenting, and socioemotional development. *Child Development*, 61, 311-346.

McNeal, R. B. (1995). Extracurricular activities and high school dropouts. *Sociology of Education*, 68, 62-81.

McNeely, C., Shew, M. L., Beuhring, T., Sieving, R., Miller, B. C., & Blum, R. W. (2002). Mothers' influence on the timing of first sex among 14- and 15-year-olds. Journal of Adolescent Health, 31, 256–265.

Meece, J. L. & Kurtz-Costes, B. (2001). Introduction: The schooling of ethnic minority children and youth. *Educational Psychologist*, 36, 1-7.

Meece, J. L. (1991). The classroom context and students' motivational goals. In M. Maehr & P. Pintrich (Eds.), *Advances in motivation and achievement* (Vol. 7, pp. 261-286). Greenwich, CT: JAI Press,

Meece, J. L. (1994). The role of motivation in self-regulated learning. In D. H. Schunk & B. J. Zimmerman (Eds.), *Self-regulation of learning and performance* (pp. 25-44). Hillsdale, NJ: Lawrence Erlbaum Associates.

Meece, J. L., & Miller, S. D. (2001). A longitudinal analysis of elementary school students' achievement goals in literacy activities. *Contemporary Educational Psychology*, 26, 454-480.

Meece, J. L., Wigfield, A., & Eccles, J. S. (1990). Predictors of math anxiety and its consequences for young adolescents' course enrollment intentions and performances in mathematics. *Journal of Educational Psychology*, 82, 60-70.

Meichenbaum, D., & Butler, L. (1980). Toward a conceptual model of the treatment of test anxiety: Implications for research and treatment. In I. G. Sarason (Ed.), *Test anxiety: Theory, research, and applications*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Meier, Deborah, Alfie Kohn, Linda Darling-Hammond, Theodore R. Sizer, George Wood (2004). *Many Children Left Behind*. Boston, MA. Beacon Press.

Menges, R. J., and Mathis, B. C. (1988). *Key Resources on Teaching, Learning, Curriculum, and Faculty Development: A Guide to the Higher Education Literature*. San Francisco: Jossey-Bass Publishers

Merriam, S. B. (1998) *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass Publishers.

Merriam, S. B. and Associates (2002). *Qualitative research in practice: Examples for discussion and analysis*. San Francisco: Jossey-Bass Publishers.

Middleton, M. J., & Midgley, C. (1997). Avoiding the demonstration of lack of ability: An unexplored aspect of goal theory. *Journal of Educational Psychology*, 89, 710-718.

Midgley, C. (2002). *Goals, goal structures, and adaptive learning*. Mahwah, NJ: Erlbaum.

Midgley, C., & Edelin, K. C. (1998). Middle school reform and early adolescent well-being: The good news and the bad. *Educational Psychologist*, 33, 195-206.

Midgley, C., Feldlaufer, H., & Eccles, J.S. (1989). Student/teacher relations and attitudes toward mathematics before and after the transition to junior high school. *Child Development*, 60, 981-992.

Midgley, C., Kaplan, A., & Middleton, M. (2001). Performance-approach goals: Good for what, for whom, and under what circumstances? *Journal of Educational Psychology,* 93, 77-87.

Midgley, C., Kaplan, A., Middleton, M., Maehr, M. L., Urdan, T., Anderman, L. H., Anderman, E., & Roeser, R. L. (1998). The development and validation of scales assessing students' achievement goal orientations. *Contemporary Educational Psychology*, 23, 113-131.

Miller, S. A. (1988). Parents' beliefs about children's cognitive development. *Child Development*, 59, 259-285.

Miller, S. A., & Davis, T. L. (1992). Beliefs about children: A comparative study of mothers, teachers, peers, and self. *Child Development*, 63, 1251-1265.

Miller, S. A., Manhal, M., & Mee, L. L. (1991). Parental beliefs, parental accuracy, and children's cognitive performance: A Search for causal relations. *Developmental Psychology*, 27, 267-276.

Mischel, W., & Mischel, C. (1983). Development of children's knowledge of self-control strategies. *Child Development*, 54, 603-619.

Mistry, R.S., Vandewater, E.A., Houston, A.C., & McLoyd, V.C. (2002). Economic well-being and children's social adjustment: The role of family process in an ethnically diverse low-income sample. *Child Development*, 73, 935-951.

Morris, L. W., Davis, M. A., & Hutchings, C. J. (1981). Cognitive and emotional components of anxiety: Literature review and a revised worry-emotionality scale. *Journal of Educational Psychology*, 73, 541-555.

Murphy, P. K., & Alexander, P. A. A motivated exploration of motivation terminology. *Contemporary Educational Psychology*, 25, 3-53.

Murray, C., & Greenberg, M. T. (2000). Children's relationship with teachers and bonds with school: an investigation of patterns and correlates in middle childhood. *Journal of School Psychology*, 38, 423–445.

Myers, D. G., & Diener, E. (1995). Who Is happy? *Psychological Science*, 6 , 10-19

National Center for Health Statistics (2011). *Health, United States, 2010: With Special Feature on Death and Dying*. Hyattsville, MD: U.S. Department of Health and Human Services; 2011.

National Research Council (2004). *Engaging schools: Fostering high school students' motivation to learn.* Washington, DC: National Academies Press.

National School Boards Association (2009). Beliefs and Policies of the National School Boards Association. Alexandria, VA: National School Boards Association; 2009.

Nelson Le Gall, S., & Glor-Sheib, S. (1985). Help seeking in elementary classrooms: An observational study. *Contemporary Educational Psychology*, 10, 58-71.

Nelson-Le Gall, S., & Jones, E. (1990). Cognitive-motivational influences on task-related help-seeking behavior of Black children. *Child Development*, 61, 581-589.

Neuman, W.L., & Kreuger, L.W. (2003). *Social work research methods: Qualitative and quantitative approaches*. Boston, MA: Allyn & Bacon.

Newman, R. S. (1994). Adaptive help-seeking: A strategy of self-regulated learning. In D. H. Schunk & B. J. Zimmerman*: Self-regulation of learning and performance: Issues and educational* applications (pp. 283-301). Hillsdale, NJ: Lawrence Erlbaum Associates.

Newman, R. S. (2002). What do I need to do to succeed… when I don't understand what I am doing!? Developmental influences on students' adaptive help-seeking. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 285-306). San Diego: Academic Press.

Newman, R. S., & Goldin, L. (1990). Children's reluctance to seek help with schoolwork. *Journal of Educational Psychology*, 82, 92-100.

Newman, R. S., & Schwager, M. T. (1995). Students' help seeking during problem solving: Effects of grade, goals, and prior achievement. *American Educational Research Journal*, 94, 3-17.

Nicholls, J. G. (1976). When a test measures more than its name: The case of the Test Anxiety Scale for Children. *Journal of Consulting and Clinical Psychology*, 20, 321-326.

Nicholls, J. G. (1978). The development of the concepts of effort and ability, perceptions of academic attainment, and the understanding that difficult tasks require more ability. *Child Development*, 49, 800-814.

Nicholls, J. G. (1979). Development of perception of own attainment and causal attributions for success and failure in reading. *Journal of Educational* Psychology, 71, 94-99.

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review*, 91, 328-346.

Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge MA: Harvard University Press.

Nicholls, J. G. (1990). What is ability and why are we mindful of it? A developmental perspective. In R. J. Sternberg & J. Kolligian (Eds.), *Competence considered* (pp. 11-40). New Haven, CT: Yale University Press.

Nicholls, J. G., Cobb, P., Yackel, E., Wood, T., & Wheatley, G. (1990). Students' theories of mathematics and their mathematical knowledge: Multiple dimensions of assessment. In G. Kulm (Ed.)., *Assessing higher order thinking in mathematics* (pp. 137-154). Washington, DC: American Association for the Advancement of Science.

Nicholls. J. G., & Miller, A. T. (1984). The differentiation of the concepts of difficulty and ability. *Child Development*, 54, 951-959.

Noguera, P. (2010, June 14). A New Vision of School Reform. *The Nation*, 282, 1.

North, R. C., Holsti, O. R., Zaninovich, G. M., & Zinnes, D. A. (1963). *Content analysis.* Chicago: Northwestern University Press.

Oakes, J., Gamoran, A., & Page, R.N. (1992). Curriculum differentiation: Opportunities, outcomes, and meanings. In P. Jackson (Ed.), *Handbook of research on curriculum* (pp. 570-608). New York: Macmillan.

Oetting, E. & Beauvais, F. (1991). Orthogonal cultural identification theory: The cultural identification of minority adolescents. *The International Journal of Addictions*, 25, 655-685.

Okagaki, L. (2001). Triarchic model of minority children's school achievement. *Educational Psychologist*, 36, 9-20.

Olsen, D., Kuh, G. D., Schilling, K. M., Schilling, K., Connolly, M., Simmons, A., and Vesper, N. (1998). *Great Expectations: What First-Year Students Say They Will Do and What They Actually Do.* Paper presented at the annual meeting of the Association for the Study of Higher Education, Miami, FL

Olson. L. (1997). *Made in America: Immigrant students in our public schools*. New York, NY: New Press.

O'Neil, H. F., Jr., Wang, S., Jr., & Lee, C. (2003). assessment of teamwork skills via a teamwork questionnaire. In H. F. O'Neil Jr. & R. S. Perez. (eds.). *Technology applications in education: A learning view* (pp. 283-303). Mahwah, NJ: Erlbaum.

Osterman, K. F. (2000). Students' need for belonging in the school community. *Review of Educational Research, 70*, 323–367.

Oyserman, D., Coon, H. M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin*, 128, 3-72.

Pace, C. R. (1990). The Undergraduates: A Report of Their Activities and College Experiences in the 1980s. Los Angeles: Center for the Study of Evaluation, UCLA Graduate School of Education.

Padilla, A.M. & Gonzalez, R. (2001). Academic performance of immigrant and U.S. born Mexican-Heritage students: Effects of schooling in Mexico and Bilingual/English language instruction. *American Educational Research Journal*, 38, 727-742.

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research*, 66, 543-578.

Pallas, A. M., Entwisle, D. R., Alexander, K. L. & Stluka. M. F. (1994). Ability-group effects: Instructional, social, or institutional? *Sociology of Education*, 67, 27-46.

Palmer, Parker (1998). *The Courage to Teach*. San Francisco, CA. Jossey-Bass Inc.

Palumbo, D. B. (1990). Programming language/problem-solving research: A review of relevant issues. *Review of Educational Research*, *60*(1), 65-89.

Paris, S. G., & Byrnes, J. P (1989). The constructivist approach to self-regulation and learning in the classroom. In B. J. Zimmerman & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement: Theory, research, and practice.* New York: Springer-Verlag.

Pascarella, E. T. (1985). College Environmental Influences on Learning and Cognitive Development: A Critical Review and Synthesis. In Higher Education: Handbook of Theory and Research, Vol. 1, edited by J. C. Smart, 1-62. New York: Agathon.

Pascarella, E. T., Smart, J. C., and Ethington, C. A. (1986). Long-Term Persistence of Two-Year College Students. Research in Higher Education, 24(1): 47-71.

Pascarella, E. T., and Terenzini, P. T. (1991). How College Affects Students: Findings and Insights From Twenty-Years of Research (1st ed.). San Francisco: Jossey-Bass Publishers.

Pascarella, E. T. (2001). Cognitive Growth in College: Surprising and Reassuring Findings. Change, 33(6): 20-27.

Patrick, H. (1997). Social self-regulation: Exploring the relations between children's social relationships, academic self-regulation, and school performance. *Educational Psychologist*, 32, 209-220.

Partnership for 21st Century Skills (2007). 21st century skills assessment. Retrieved from (http://p21.org/)

Patton, Michael Q. 1990. *Qualitative Evaluation and Research Methods. 2nd Edition.* Newbury Park, Calif.: Sage Publications.

Pekrun, R. (1993). Facets of adolescents' academic motivation: A longitudinal expectancy-value approach. In M. Maehr & P. Pintrich (Eds.), *Advances in motivation and achievement* (Bd. 8, S. 139-189). Greenwich, CT: JAI Press.

Pekrun, R. (2000). A social-cognitive, control-value theory of achievement emotions. In J. Heckhausen (Ed.), *Motivational psychology of human development* (pp. 143-163). Oxford, UK: Elsevier.

Pederson, L. L., Koval, J. J., & O'Connor, K. (1997). Are psychosocial factors related to smoking in grade-6 students? *Addictive Behaviors, 22,* 169–181.

Phinney, J.S. & Devich-Navarro, M. (1997). Variations in bicultural identification among African-American and Mexican-American adolescents. *Journal of Research on Adolescence*, 7, 3-32.

Pianta, R. C., & Cox, M. J. (1999). The changing nature of the transition to school: Trends for the next decade. In R. C. Pianta & M. J. Cox (Eds.), *The transition to kindergarten* (pp. 363-379). Baltimore: P. H. Brookes Publishing.

Pianta, R. C., Rimm-Kaufman, S. E., & Cox, M. J. (1999). Introduction: An ecological approach to kindergarten transition. In R. C. Pianta & M. J. Cox (Eds.), *The transition to kindergarten* (pp. 3-12). Baltimore: P. H. Brookes Publishing.

Pintrich, P. R. & Schrauben, B. (1992). Students' motivational beliefs and their cognitive engagement in classroom academic tasks. In D. Schunk & J. Meece (Eds.), *Student perceptions in the classroom* (pp. 149-183). Hillsdale, NJ: Erlbaum.

Pintrich, P. R. (2000a). An achievement goal theory perspective on issues in motivation terminology, theory, and research. *Contemporary Educational Psychology*, 25, 92-104.

Pintrich, P. R. (2000b). Multiple pathways, multiple goals: The role of goal orientation in learning and achievement. *Journal of Educational Psychology*, 92, 54-555.

Pintrich, P. R. (2000c). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 451-502). San Diego: Academic Press.

Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology, 95*, 667-686.

Pintrich, P. R., & Schunk, D. H. (2003). *Motivation in education: Theory, research, and application* (2nd Ed.). Englewood Cliffs, NJ: Merrill-Prentice Hall.

Pintrich, P. R., & Zusho, A. (2002). The development of academic self-regulation: The role of cognitive and motivational factors. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 250-284). San Diego: Academic Press.

Pintrich, P. R., Marx, R. W., & Boyle, R. A. (1993). Beyond cold conceptual change: The role of motivational beliefs and classroom contextual factors in the process of conceptual change. *Review of Educational Research*, 63, 167-199.

Pomerantz, E. M., & Ruble, D. N. (1997). Distinguishing multiple dimensions of conceptions of ability: Implications for self-evaluation. *Child Development*, 68, 1165-1180.

Pomerantz, E. M., & Saxon, J. L. (2001). Conceptions of ability as stable and self-evaluative processes: A longitudinal examination. *Child Development*, 72. 152-173.

Portes, A. & Rumbaut, R.G. (2001). *Legacies: The story of the immigrant second generation.* Berkeley: University of California Press.

Putnam, Robert D. (2000). *Bowling alone: the collapse and revival of American community.* New York, NY: Simon & Schuster.

Quintana, S.M. & Vera, E.M. (1999). Mexican-American children's ethnic identity, understanding of ethnic prejudice, and parental ethnic socialization. *Hispanic Journal of Behavioral Sciences*, 21, 387-404.

Ramey, C. T., & Ramey, S. l. (1999). Beginning school for children at risk. In R. C. Pianta & M. J. Cox (Eds.), *The transition to kindergarten* (pp. 217-251). Baltimore: P. H. Brookes Publishing.

Ramsey, J. (2002), Learning journals and learning communities. *Journal of Management Education*, Vol. 26 No. 4, pp. 380-401.

Ravitz, Jason. (2008). *New Tech High Schools: Results of the National Survey of Project Based Learning and High School Reform conducted by the Buck Institute for Education*, www.bie.org accessed on November 2, 2012.

Raynor, J. O. (1982). Future orientation, self-evaluation, and achievement motivation: Use of an expectancy X value theory of personality functioning and change. In N. T. Feather (Ed.), *Expectations and actions: Expectancy-value models in psychology* (pp. 97-124). Hillsdale, NJ: Erlbaum.

Reeve, J., Deci, E. L., & Ryan, R. M. (2004). Self-determination theory: A dialectical framework for understanding sociocultural influences on student motivation. In D. M. McInerney & S. Van Etten (Eds.), *Big theories revisited (Vol. 4: Sociocultural influences on motivation and learning*, (pp. 31-60). Greenwich, CT: Information Age Press.

Reeve, J., Nix, G., & Hamm, D. (2003). Testing models of the experience of self-determination in intrinsic motivation and the conundrum of choice. *Journal of Educational Psychology*, 95, 375-392.

Renninger, K. A., Hidi, S. & Krapp, A. (Eds.). (1992). *The role of interest in learning and development*. Hillsdale, NJ: Erlbaum.

Renninger, K.A. (1990). Children's play interests, representation, and activity. In R. Fivush & J. Hudson (Eds.), *Knowing and remembering in young children* (pp.127-165). Cambridge University Press.

Resnick, M., and Wilensky, U. (1997). Diving into Complexity: Developing Probabilistic Decentralized Thinking through Role-Playing Activities. *Journal of the Learning Sciences*, vol. 7, no. 2, pp. 153-172

Roberts, T. A. (1991). Gender and the influence of evaluations on self-assessments in achievement settings. *Psychological Bulletin*, 109, 297-308.

Robbins, S.B., Lauver, K., Le, H., Davis, D. & Langley. R. (2004). Do Psycho-Social and Study Skill Factors Predict College Outcomes? A Meta-Analysis. Psychological Bulletin, 130(2), 261-288.

Roderick, M., & Camburn, E. (1999). Risk and recovery from course failure in the early years of high school. *American Educational Research Journal,* 36, 303-344.

Roeser, R. W., Midgley, C., & Urdan, T. C. (1996). Perceptions of the school psychological environment and early adolescents' psychological and behavioral functioning in school: The mediating role of goals and belonging. *Journal of Educational Psychology*, 88, 408-422.

Roeser, R.W. & Nasir, N. (in press). Identity and self processes in school learning, achievement and well-being. In Alexander, P., & Winne, P.H. (Eds). *Handbook of educational psychology* (2nd edition). Mahwah, NJ: Lawrence Erlbaum.

Roeser, R.W. & Rodriquez, R. (2004, April). On academic motivation, achievement, and the diversity of selfways in school during early adolescence. Paper presented at the annual meeting of American Educational Research Association, San Diego, CA.

Roeser, R.W. (2004a). Competing schools of thought in achievement goal theory? In M.L. Maehr & P.R. Pintrich (Eds.), Advances in Motivation and Achievement, *Volume 13: Motivating Students, Improving* Schools (pp. 265-299). New York: Elsevier.

Roeser, R.W. (2004b, July). The diversity of selfways in school during adolescence project. Paper presented at the annual meeting of William T. Grant Faculty Scholars Program, Vail, CO.

Roeser, R.W., & Eccles, J.S., (2000). Schooling and mental health. A.J. Sameroff, M. Lewis, & S.M. Miller (Eds.), *Handbook of Developmental Psychopathology, Second Edition* (135-156). New York: Plenum.

Roeser, R.W., Eccles, J.S. & Strobel, K. (1998). Linking the study of schooling and mental health: Selected issues and empirical illustrations at the level of the individual. *Educational Psychologist*, 33, 153-176.

Roeser, R.W., Lowe, A., Sattler, R., Gehlbach, H., & Strobel, K.R. (2003, April). On identity and motivation to learn among Latino adolescents: Patterns, dynamics, and relation to educational outcomes. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Roeser, R.W., Marachi, R., & Gelhbach, H. (2002). A goal theory perspective on teachers' professional identities and the contexts of teaching. In C.M. Midgley (Ed.), *Goals, goal structures, and patterns of adaptive learning* (pp. 205-241). New Jersey: Erlbaum.

Roeser, R.W., Strobel, K.R., Quihuis, G. (2002). Studying early academic motivation, social-emotional functioning, and engagement in learning: Variable- and person-centered approaches. *Anxiety, Stress, and Coping*, 1-24.

Rosenholtz, S. J., & Simpson, C. (1984). The formation of ability conceptions: Developmental trend or social construction? *Review of Educational Research*, 54, 31-63.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs*, 80, 1-28.

Ruble, D. (1983). The development of social comparison processes and their role in achievement-related self-socialization. In E. T. Higgins, D. N. Ruble, and W. W. Hartup (Eds.), *Social cognition and social development: A sociocultural perspective* (pp. 134-157). New York: Cambridge University Press.

Ruble, D. N. (1994). A phase model of transitions: Cognitive and motivational consequences. IN M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 26, pp. 163-214). New York: Academic Press.

Ruble, D. N., & Martin, C. L. (1998). Gender development. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology* (5th ed., Vol. 3, pp. 933-1016). New York: John Wiley and Sons.

Ryan, A. M. (2001). The peer group as a context for the development of young adolescents' motivation and achievement. *Child Development*, 72, 1135-1150.

Ryan, A. M., Gheen, M. H., & Midgley, C. (1998). Why do some students avoid asking for help? An examination of the interplay among students' academic self-efficacy, teachers' social-emotional role, and the classroom goal structure. *Journal of Educational Psychology*, 90, 528-535.

Ryan, A. M., Pintrich, P.R., & Midgley, C. (2001). Avoiding seeking help in the classroom: Who and why? *Educational Psychology Review*, 13, 93-114.

Ryan, R. M. & Deci, E. L. (2000a). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68-78.

Ryan, R. M. (1992). Agency and organization: Intrinsic motivation, autonomy, and the self in psychological development. In J. Jacobs (Ed.), *Nebraska Symposium on Motivation* (Vol., 40, pp. 1-56). Lincoln, NE: University of Nebraska Press.

Ryan, R. M. (1995). Psychological needs and the facilitation of integrative processes. *Journal of Personality,* 63, 397-427.

Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, 57, 749-761.

Ryan, R. M., & Deci, E. L. (2000b). When rewards compete with nature: The undermining of intrinsic motivation and self-regulation. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 13-54). San Diego: Academic Press.

Ryan, R. M., & Deci, E. L. (2002). An overview of self-determination theory: an organismic-dialectical perspective. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination theory research* (pp. 3-33). Rochester, NY: University of Rochester Press.

Ryan, R. M., Connell, J. P. & Deci, E. L. (1985). A motivational analysis of self-determination and self-regulation in education. In C. Ames & R. Ames (Eds.), *Research on motivation in education. Vol. 2: The classroom milieu* (pp. 13-51). London: Academic Press.

Sage, N. A., & Kindermann, T. A. (1999). Peer networks, behavior contingencies, and children's engagement in the classroom. *Merrill-Palmer Quarterly*, 45, 143-171.

Sansone, C., & Harackiewicz, J. M. (2000). Looking beyond rewards: The problem and promise of intrinsic motivation. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 1-9). San Diego: Academic Press.

Sansone, C., & Harackiewicz, J. M. (Eds.) (2000). *Intrinsic and extrinsic motivation: The search for optimal motivation and performance*. San Diego: Academic Press.

Sarason, I. G. (1980). Introduction to the study of test anxiety. In I. G. Sarason (Ed.), *Test anxiety: Theory, research, and application* (pp. 3-14). Hillsdale, NJ: Lawrence Erlbaum Associates.

Savickas, M. L. (2008). Career construction theory. In F. Leong (Ed.) *Encyclopedia of Counseling* (Volume 4: Career Counseling) (pp. 1427-1429). Thousand Oaks, CA: Sage.

Schatzman, L. and Strauss, A. L. (1973) *Field Research: Strategies for a Natural Sociology*. Englewood Cliffs, NJ: Prentice Hall.

Schickedanz, J. A. (1995). Family socialization and academic achievement. *Journal of Education, 177*(1), 17-38.

Schiefele, U. & Krapp, A. (1996). Topic interest and free recall of expository text. *Learning and Individual Differences*, 8, 141-160.

Schiefele, U. & Schreyer, I. (1994). Intrinsische Lernmotivation und Lernen [Intrinsic motivation and learning]. *Zeitschrift für Pädagogische Psychologie*, 8, 1-13.

Schiefele, U. (1991). Interest, learning, and motivation. *Educational Psychologist*, 26, 299-323.

Schiefele, U. (1996a). *Motivation und Lernen mit Texten [Motivation and text learning]*. Göttingen: Hogrefe.

Schiefele, U. (1996b). Topic interest, text representation, and quality of experience. Contemporary Educational Psychology, 21, 3-18.

Schlechty, P. (2001) *Inventing Better Schools: An Action Plan for Educational Reform*, Jossey-Bass

Schmidt, H.G., Van der Molen, H.T., Winkel, W.W.R., & Wijnen, W.H.F.W. (2009). Constructivist, problem-based learning does work: A meta-analysis of curricular comparisons involving a single medical school. *Educational Psychologist*, 44, 227–249.

Schneider, B. & Coleman, J. S. (1993). *Parents, their children, and schools*. Boulder, CO: Westview Press.

Schneider, J. A. (2008). Social capital, civic engagement and trust. *Anthropologica, 50,* 425–428.

Schneider, K. (1996). Intrinsically motivated activity as an example of creativity and related behavioral systems. In H. Heckhausen & J. Kuhl (Eds.), *Motivation, volition, and action*. Gottingen: Hogrefe.

Schunk, D. H. (1987). Peer models and children's behavioral change. *Review of Educational Research*, 57, 149-174.

Schunk, DH. 1990. Goal setting and self- efficacy during self-regulated learning. *Educational Psychology.* 25:71–86

Schunk, D. H. (1991). Goal setting and self-evaluation: A social cognitive perspective on self-regulation. In M. L. Maehr & P. R. Pintrich (Eds.), *Advances in motivation and achievement* (Vol. 7, pp. 85-113). Greenwich, CT: JAI Press.

Schunk, D. H. (1994). Self-regulation of self-efficacy and attributions in academic settings. In D. H. Schunk & B. J. Zimmerman (Eds.), *Self-regulation of learning and performance.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Schunk, D. H., & Ertmer, P. A. (2000). Self-regulation and academic learning: Self-efficacy enhancing interventions. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 631-649). San Diego: Academic Press.

Schunk, D. H., & Pajares, F. (2002). The development of academic self-efficacy. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 15-32). San Diego: Academic Press.

Schunk, D. H., & Zimmerman, B. J. (Eds.) (1994). *Self-regulation of learning and performance.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Seginer, R. (2006). Parents' educational involvement: A developmental ecology perspective. *Parenting: Science and Practice, 6*(1), 1-48.

Shell, D.F., Colvin, C., & Bruning, R.H. (1995). Self-efficacy, attribution, and outcome expectancy mechanisms in reading and writing achievement: Grade-level and achievement-level differences. *Journal of Educational Psychology*, 87, 386-398

Sherwood, A.L. (2004). Problem-based learning in management education: a framework for designing context. *Journal of Management Education*, Vol. 28 No. 5, pp. 536-57.

Shochet, I. M., Dadds, M. R., Ham, D. & Montague, R. (2006). School connectedness is an underemphasized parameter in adolescent mental health: Results of a community prediction study. *Journal of Clinical Child and Adolescent Psychology*, 35(2), 170-179.

Sigel, I. E., McGillicuddy-DeLisi, A. V., & Goodnow, J. J. (Eds.). (1992*). Parental belief systems (2nd ed.).* Hillsdale, NJ: Erlbaum.

Silverman, W. K., La Greca, A. M., & Wasserstein, S. (1995). What do children worry about? Worries and their relations to anxiety. *Child Development*, 66, 671-686.

Simmons, R. G., & Blyth, D. A. (1987). *Moving into adolescence: The impact of pubertal change and school context*. Hawthorn, NY: Aldine de Gruyter.

Simpkins, S. D., Fredricks, J. A., Davis-Kean, P. E., & Eccles, J. S. (2004). Healthy Mind, Healthy Habits: The Influence of Activity Involvement in Middle Childhood In A. C. Huston & M. N. Ripke (Eds), *Middle Childhood: Contexts of Development*, New York: Cambridge University Press.

Skaalvik, E. (1997). Self-enhancing and self-defeating ego orientation: Relations with task and task avoidance orientation, achievement, self-perceptions, and anxiety. *Journal of Educational Psychology*, 89, 71-81.

Skaalvik, E. M., & Bong, M. (2003). Self-concept and self-efficacy revisited: A few notable differences and important similarities. In Marsh, H. W., R. Craven, & D. M. McInerney (Eds.), *International advances in self-research* (pp. 67-90). Greenwich, CT: Information Age Publishing.

Skaalvik, E.M. & Rankin, R.J. (1996, April). Self-concept and self-efficacy: Conceptual analysis. Paper presented at the Annual Meeting of the American Educational Research Association in New York.

Skinner, B. F. (1953). *Science and human behavior.* New York: Macmillan.

Skinner, E. A. (1990). Age differences in the dimensions of perceived control during middle childhood: Implications for developmental conceptualizations and research. *Child Development,* 61, 1882-1890.

Skinner, E. A. (1995). *Perceived control, motivation, and Coping*. Thousand Oaks, CA: Sage Publications.

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology*, 85, 571-581.

Skinner, E. A., & Wellborn, J. G. (1994). Coping during childhood and adolescence: A motivational perspective. In D. Featherman, R. Lerner, & M. Perlmutter (Eds.), *Life-span development and behavior* (pp. 91-133). Hillsdale, NJ: Erlbaum.

Skinner, E. A., Chapman, M., & Baltes, P. B. (1988). Control, means-ends, and agency beliefs: A new conceptualization and its measurement during childhood. *Journal of Personality and Social Psychology*, 54, 117-133.

Skinner, E. A., Gembeck-Zimmer, M. J., & Connell, J. P. (1998). Individual differences and the development of perceived control. *Monographs of the Society for Research in Child Development* (Serial No. 254, Vol. 6, No.2-3, pp. 1-220).

Slaughter-Defoe, D. T., Nakagawa, K., Takanishi, R., & Johnson, D. J. (1990). Toward cultural/ecological perspectives on schooling and achievement in African- and Asian-American children. *Child Development*, 61, 363-383.

Slavin, R. E. (1995). Cooperative learning (2nd Ed.). Boston: Allyn and Bacon.

Slavin, R.E. (1990). Achievement effects of ability grouping in secondary schools: A best-evidence synthesis. *Review of Educational Research*, 60, 471-499.

Smiley, P. A., & Dweck, C. S. (1994). Individual differences in achievement goals among young children. *Child Development*, 65, 1723-1743.

Smith, J. K, & Heshusms, L. (1986). Closing down the conversation: The end of the quantitative-qualitative debate among educational researchers *Educational Researcher,* 15(1), 4-12

Spady, W. G. (1970). Dropouts From Higher Education: An Interdisciplinary Review and Synthesis. Interchange, 1(1): 64-85.

Spencer, M. B., Noll, E., Stoltzfus, J., & Harplani, V. (2001). Identify and school adjustment: Revising the "Acting White" assumption. *Educational Psychologist*, 36, 31-44.

Spencer, S. J., Steele, M. & Quinn, D. M. (1999), Stereotype threat and women's math performance. *Journal of Experimental Social Psychology*, 35, 4-28.

Srabstein J, Piazza T. Public health, safety and educational risks associated with bullying behaviors in American adolescents. *International Journal of Adolescent Medicine and Health* 2008;20(2):223–233.

Stake, R. E. (1995) *The Art of Case Study Research.* Thousand Oaks, CA: Sa

Stamps, J., & Lipnack, J. (2000). *A systems science of networked organizations.* Pockington, UK: International Society for Systems Research.

Stanton, W. R., & Silva, P. A. (1992). A longitudinal study of the influence of parents and friends on children's initiation of smoking. *Journal of Applied Developmental Psychology, 13,* 423–434.

Steele, C. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist*, 52, 613-629.

Steele, C. M. (1992, April). *Race and the schooling of black Americans.* Atlantic Monthly, 269(4), 68-78.

Steele, C.M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African-Americans. *Journal of Personality and Social Psychology.*

Steinberg, L. 2007. *Adolescence* (8th Edition). New York: McGraw-Hill.

Steinberg, L., Dornbusch, S., & Brown, B. (1992). Ethnic differences in adolescents achievements: An ecological perspective. *American Psychologist*, 47, 723-729.

Stevens, M. J., & Campion, M. a. (1994). The knowledge, skill, and ability requirements for teamwork: Implications for human resource management. *Journal of Management, 20,* 503-530.

Stevens, R. J., & Slavin, R. E. (1995). The cooperative elementary school: Effects on students' achievement, attitudes, and social relations. *American Educational Research Journal*, 32, 321-351.

Stevenson, D. L., & Baker, D. P. (1987). The family-school relation and the child's school performance. *Child Development*, 58, 1348-1357.

Stevenson, H. W., Chen, C., & Uttal, D. H. (1990). Beliefs and achievement: A study of black, white, and Hispanic children. *Child Development*, 61, 508-523.

Stipek, D. J., & Mac Iver, D. (1989). Developmental change in children's assessment of intellectual competence. *Child Development*, 60, 521-538.

Stipek, D. J., Recchia, S., & McClintic, S. M. (1992). Self-evaluation in young children. *Monographs of the Society for Research in Child Development*, 57 (2, Serial No. 226).

Stoecker, J. L., Pascarella, E. T., and Wolfe, L. (1988). Persistence in Higher Education: A 9-Year Test of a Theoretical Model. Journal of College Student Development, 29(3): 196-209.

Strauch, B. 2003. *The Primal Teen*. New York: Doubleday.

Suarez-Orozco, C. & Suarez-Orozco, M. (2001). *Children of Immigration.* Cambridge: Harvard University Press.

Suchetka and Galbincea (2006). Cleveland Rated Poorest City for Second Time. *The Plain Dealer*. Cleveland, Ohio

Super, C. M. & Harkness, S. (2002). Culture structures the environment for development. *Human Development*, 45, 270-274.

Szalacha, L.A., Erkut, S., Garcia-Coll, C., Alarcon, O, Fields, J.P., & Ceder, I. (2003). *Discrimination and Puerto Rican children's and adolescents' mental health. Cultural diversity and ethnic minority psychology*, 9, 141-155.

Taylor, L. C., Clayton, J. D., & Rowley, S. J. (2004). Academic socialization: Understanding parental influences on children's school-related development in the early years. *Review of General Psychology, 8*(3), 163-178.

Taras H, Potts-Datema W (2005a). Chronic health conditions and student performance at school. *Journal of School Health,* 75(7):255–266.

Taras H, Potts-Datema W (2005b). Sleep and student performance at school. *Journal of School Health,* 75(7):248–254.

Taras H, Potts-Datema W (2005d). Childhood asthma and student performance at school. *Journal of School Health,* 75(8):296– 312.

Tatum, B. D. (1997). *"Why are all the Black kids sitting together in the cafeteria?" and other conversations about race*. New York: Basic Books.

Taylor, R. D., Casten, R., Flickinger, S., Roberts, D., & Fulmore, C. D. (1994). Explaining the school performance of African-American adolescents. *Journal of Research on Adolescence,* 4, 21-44.

Teachman, J., Paasch, K., & Carver, K. (1997), Social capital and the generation of human capital, *Social Forces*, 75, 1-17.

Tenenbaum, H. R., & Leaper, C. (2003). Parent-child conversations about science: The socialization of gender inequities? *Developmental Psychology,* 39, 34-47.

Thompson, M. S., Alexander, K. L., & Entwisle, D. R. (1988). Household composition, parental expectations, and school achievement. *Social Forces*, 67, 424-451.

Thoreau, H. D. (1854). *Walden or life in the woods*. Boston, MA: Ticknor and Fields.

Thorkildsen, T., & Nicholls, J. G. (1998). Fifth graders' achievement orientations and beliefs: Individual and classroom differences. *Journal of Educational Psychology*, 90, 179-201.

Tierney, W. G., Corwin, Z. B., and Colyar, J. E. (Eds.) (2004). Preparing for College: Nine Elements for Effective Outreach. Albany, NY: State University of New York Press.

Tinto, V. (1975). Dropout from Higher Education: A Theoretical Synthesis of Recent Research. Reviewof Educational Research, 45: 89-125.

Tinto, V. (1987). Leaving College: Rethinking the Causes and Cures of Student Attrition. Chicago:University of Chicago Press.

Titscher, Stefan, Meyer, Michael, Wodak, Ruth, & Vetter, Eva (2000). *Methods of text and discourse analysis* (Bryan Jenner, Trans.). London: Sage.

Tobias, S. (1985). Test anxiety: Interference, deficient skills, and cognitive capacity. *Educational Psychologist*, 20, 135-142.

Tobias, S. (1994). *Interest, prior knowledge, and learning. Review of Educational Research*, 64, 37-54.

Todt, E. (1990). Development of interest. In H. Hetzer (Ed.), *Applied developmental psychology of children and youth*. Wiesbaden: Quelle & Meyer.

Toffler, A. (1970). *Future shock*. New York: Random House.

Townsend, K. C. & McWhirter, B. T. (2005). Connectedness: A review of the literature with implications for counseling, assessment, and research. *Journal of Counseling and Development, 83,* 91-201.

Triandis, H. C., & Suh, E. M. (2002). *Cultural influences on personality. Annual Review of Psychology*, 53, 133-160.

Tschannen-Moran, M., Woolfolk Hoy, A., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research*, 68, 202-248.

U.S. Department of Education, National Center for Education Statistics. (2002). *The Condition of Education 2002* (NCES 2002-025), Section 1.

U.S. Department of Education, National Center for Education Statistics. (2003a). *Projections of Education Statistics to* 2013 (NCES 2004-013), Washington, DC: U.S. Government Printing Office, 2002.

U.S. Department of Education, National Center for Education Statistics. (2003b). *Digest of Education Statistics*, 2002 (NCES 2003-060), Chapter 2.

U.S. Department of Education (2004). The Condition of Education 2004 (NCES 2004-077). Washington, DC: U.S. Government Printing Office.

Urdan, T. C. (1997). Achievement goal theory: Past results, future directions. In P. R. Pintrich & M. L. Maehr (Eds.), *Advances in motivation and achievement* (Vol. 10, pp. 99-142). Greenwich, CT: JAI Press.

Urdan, T. C. (Ed.) (1999). *The role of context: Advances in motivation and achievement* (Vol. 11). Greenwich, CT: JAI Press.

Urdan, T., & Giancarlo, C. (2001). A comparison of motivational and critical thinking orientations across ethnic groups. In D. M. McInerney and S. V. Etten (Eds.), *Research on sociocultural influences on motivation and learning, Volume 1* (pp. 3760). Greenwich, CT: Information Age Publishing.

Valencia, R. R. (Ed.) (1991). *Chicano school failure and success: Research and policy agendas for the 1990s*. London: Falmer Press.

Vanfossen, B. E., Jones, J. D., & Spade, J. Z. (1987). Curriculum tracking and status maintenance. *Sociology of Education*, 60, 104-122.

Vasey, M. W., & Daliedon, E. L. (1994). Worry in children. In G. Davey & F. Tallis (Eds.), *Worrying: Perspectives on theory, assessment, and treatment* (pp. 1850-207). Chicester: Wiley.

Voelkl, K. E. (1997). Identification with school. *American Journal of Education, 105(3),* 294- 318.

Wade, S. E. (1992). How interest affects learning from text. In K. A. Renninger, S. Hidi, & A. Krapp (Eds.), *The role of interest in learning and development* (pp. 255-277). Hillsdale, NJ: Erlbaum.

Wagner, B. M., & Phillips, D. A. (1992). Beyond beliefs: Parent and child behaviors and children's perceived academic competence. *Child Development*, 63, 1380-1391.

Warburton, E. C., Bugarin, R., and Nuñez, A. M. (2001). Bridging the Gap: Academic Preparation and Postsecondary Success of First-Generation Students. *Education Statistics Quarterly*, 3 (3): 73-77

Watt, H. (2004). Development of adolescents' self-perceptions, values, and task perceptions. *Child Development*, 75, 1556-1574.

Weber, R.P. (1990). *Basic Content Analysis.* Newbury Park, CA: Sage Publications.

Wehlage, G., Rutter, R., Smith, G., Lesko, N., & Fernandez, R. (1989). *Reducing the risk: Schools as communities of support*. Philadelphia: The Falmer Press.

Weiner, B. (1992). *Human motivation: Metaphors, theories, and research.* Newbury Park, CA: Sage Publications.

Weiner, B. (2004). Attribution theory revisited: Cultural plurality and theoretical unity. In D. M. McInerney & S. Van Etten (Eds.), *Big theories revisited (Vol. 4: Sociocultural influences on motivation and learning*, pp. 13-30). Greenwich, CT: Information Age Press.

Weiner, B., (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, 92, 548-573.

Weinstein, R. S. (1989). Perception of classroom processes and student motivation: Children's views of self-fulfilling prophecies. In R. E. Ames & C. Ames (Eds.), *Research on motivation in education* (pp. 187-221). (Vol. 3). New York: Academic Press.

Weisz, J. P. (1984). Contingency judgments and achievement behavior: Deciding what is controllable and when to try. In J. G. Nicholls (Ed.), *The development of achievement motivation* (pp. 107-136). Greenwich, CT: JAI Press.

Wenger, E. (1998). Communities of Practice: Learning, Meaning and Identity, Cambridge University Press, New York, NY.

Wenger, E. (2000), Communities of practice and social learning systems. *Organization*, Vol. 7 No. 2, pp. 225-46.

Wentzel, K. (2002a). Are effective teachers like good parents? Teaching styles and student adjustment in early adolescence. *Child Development*, 73, 287-301.

Wentzel, K. R. (1989). Adolescent classroom grades, standards for performance, and academic achievement: An interactionist perspective. *Journal of Educational Psychology,* 81, 131-142.

Wentzel, K. R. (1991a). Relations between social competence and academic achievement in early adolescence. *Child Development*, 62, 1066-1078.

Wentzel, K. R. (1991b). Social competence at school: Relation between social responsibility and academic achievement. *Review of Educational Research*, 61, 1-24.

Wentzel, K. R. (1993). Does being good make the grade? Social behavior and academic competence in middle school. *Journal of Educational Psychology*, 85, 357-364.

Wentzel, K. R. (1994). Relations of social goal pursuit to social acceptance, and perceived social support. *Journal of Educational Psychology*, 86, 173-182.

Wentzel, K. R. (1996). Social goals and social relationships as motivators of school adjustment. In J. Juvonen & K. R. Wentzel (Eds.), *Social motivation: Understanding school adjustment.* New York: Cambridge University Press.

Wentzel, K. R. (1998). Social relationships and motivation in middle school: The role of parents, teachers, and peers. *Journal of Educational Psychology*, 90, 202-209.

Wentzel, K. R. (2002b). The contribution of social goal setting to children's school adjustment. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 222-246). San Diego: Academic Press.

Weiss, H. B., Mayer, E., Kreider, H., Vaughan, M., Dearing, E., Hencke, R., & Pinto, K. (2003). Making It work: Low-income working mothers' involvement in their children's education. *American Educational Research Journal, 40*(4), 879-901.

White, R. H. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, 66, 297-333.

Whitlock, J. (2006). Youth perceptions of life at school: Contextual correlates of school connectedness in adolescence. *Applied Developmental Science,*10, 13-29.

Wigfield. A. (1994). Expectancy - value theory of achievement motivation: A developmental perspective. *Educational Psychology Review*, 6, 49-78.

Wigfield, A., & Asher, S.R. (1984). Social and motivational influences on reading. In P.D. Pearson, R. Barr, M.L. Kamil, & P. Mosenthal (Eds.), *Handbook of reading research,* (pp. 423-452). New York: Longman.

Wigfield, A., & Eccles, J. (1992). The development of achievement task values: A theoretical analysis. *Developmental Review*, 12, 265-310.

Wigfield, A., & Eccles, J. S. (1989). Test anxiety in elementary and secondary school students. *Educational Psychologist*, 24, 159-183.

Wigfield, A., & Eccles, J. S. (2000). Expectancy - value theory of motivation. Contemporary Educational Psychology, 25, 68-81.

Wigfield, A., & Eccles, J. S. (2002a). Children's motivation during the middle school years. In J. Aronson (Ed.), *Improving academic achievement: Contributions of social psychology*. San Diego: Academic Press.

Wigfield, A., & Eccles, J. S. (2002b). The development of competence beliefs and values from childhood through adolescence. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 92-120). San Diego: Academic Press.

Wigfield, A., & Meece, J. (1988). Math anxiety in elementary and secondary school students. *Journal of Educational Psychology*, 80, 210-216.

Wigfield, A., & Tonks, S. (2004). The development of motivation for reading. In J. T. Guthrie, A. Wigfield, & K. C. Perencevich (Eds.). *Motivating reading comprehension: Concept Oriented Reading Instruction*. Mahwah, NJ: Erlbaum.

Wigfield, A., Battle, A., Keller, L., & Eccles, J. S. (2002). Sex differences in motivation, self-concept, career aspirations, and career choice: Implications for cognitive development. In A. McGillicuddy-DelLisi & R. DeLisi (Eds.), *Biology, society, and behavior: The development of sex differences in cognition* (pp. 93-124). Greenwich, CT: Ablex.

Wigfield, A., Byrnes, J. B., & Eccles, J. S. (in press). Adolescent development. In P. A. Alexander & P. Winne (Eds.), *Handbook of educational psychology (2nd edition)*. Mahwah, NJ: Erlbaum.

Wigfield, A., & Cambria, J. (2010). Students' achievement values, goal orientations, and interest: Definitions, development, and relations to achievement outcomes. Developmental Review, 30(1), 1-35.

Wigfield, A., Eccles, J. S., Mac Iver, D., Reuman, D., & Midgley, C. (1991). Transitions at early adolescence: Changes in children's domain-specific self-perceptions and general self-esteem across the transition to junior high school. *Developmental Psychology*, 27, 552-565.

Wigfield, A., Eccles, J. S., Yoon, K. S., Harold, R. D., Arbreton, A., Freedman-Doan, C., Blumenfeld, P. C. (1997). Changes in children's competence beliefs and subjective task values across the elementary school years: A three-year study. *Journal of Educational Psychology*, 89, 451-469.

Wigfield A, Eccles J. (1992). The development of achievement task values: a theoretical analy- sis. *Dev. Rev.* 12:265–310

Wigfield, A., & Eccles, J. S. (2000). Expectancy - value theory of motivation.
Contemporary Educational Psychology, 25, 68-81.

Wigfield, A., Eccles, J.S., & Pintrich, P.R. (1996). Development between the ages of
eleven and twenty-five. In D.C. Berliner and R.C. Calfee (Eds.), *The Handbook
of Educational Psychology*, New York: Macmillan Publishing.

Wilson, W. J. (1996). *When work disappears: the world of the new urban poor* (1st ed.).
New York: Knopf.

Winne, P. H., & Marx, R. W. (1989). A cognitive-process analysis of motivation within
classroom tasks. In C. Ames & R. E. Ames (Eds.), *Research on motivation in
education (Vol. 3, pp. 223-257).* San Diego: Academic Press.

Winston, C., Eccles, J. S., Senior, A. M., & Vida, M. (1997). The utility of an
expectancy/value model of achievement for understanding academic
performance and self-esteem in African-American and European-American
adolescents. *Zeitschrift Fur Padagogische Psychologie (German Journal of
Educational Psychology*), 11, 177-186.

Wolcott, H. F. (1994). *Transforming qualitative data: Description, analysis, and
interpretation*. Thousand Oaks: Sage Publications.

Wolters, C. A. (2003). Regulation of motivation: Evaluating an underemphasized aspect
of self-regulated learning. *Educational Psychologist*, 38, 189-206.

Wong, C.A., Eccles, J.S., & Sameroff, A.J. (2003). The influence of ethnic discrimination
and ethnic identification on African-Americans adolescents' school and
socioemotional adjustment. *Journal of Personality*, 71, 1197-1232.

Wood, George (1999). *A Time to Learn*. New York. Penguin Group.

Yee, D. K., & Flanagan, C. (1985). Family environments and self -consciousness in
early adolescence. *Journal of Early Adolescence*, 5, 59-68.

Yeung, W.J., Linver, M.R., & Brooks-Gunn, J. (2002). How money matters for young
children's development: Parental investment and family processes. *Child
Development*, 73, 1861-1879.

Yin, R. K. (1994) *Case study research: Design and methods. 2nd Ed*. Thousand Oaks,
California: Sage Publications.

Yoon, K. S., Wigfield, A., & Eccles, J. S. (1993 April). Causal relations between
mothers' and children's beliefs about math ability: A structural equation model.
Paper presented at the Annual Meeting of the American Educational Research
Association.

Youniss, J., & Ketterlinus, R. D. (1987). Communication and connectedness in mother- and father-adolescent relationships. Special Issue: Sex differences in family relations at adolescence. *Journal of Youth & Adolescence, 16(3),* 265–280.

Zeidner, M. (1998). *Test anxiety: The state of the art*. New York: Plenum Press.

Zimmerman, B. J. (1989). A social cognitive view of self-regulated learning. *Journal of Educational Psychology*, 81, 329-339.

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13-39). San Diego: Academic Press.

Zimmerman, B. J., & Kitasantas, A. (1999). Acquiring writing revision skill: Shifting from process to outcome self-regulatory goals. *Journal of Educational Psychology*, 91, 241-250.

Zimmerman, B. J., & Martinez-Pons, M. (1990). Student differences in self-regulated learning: Relating grade, sex, and giftedness to self-efficacy and strategy use. *Journal of Educational Psychology*, 82, 51-59.

APPENDIX A

MEMORANDUM OF UNDERSTANDING BETWEEN
THE CLEVELAND METROPOLITAN SCHOOL DISTRICT AND
THE CLEVELAND TEACHERS UNION, AFT LOCAL 279, AFL-CIO

RE: 2009-2010 SCHOOL YEAR
- THE METROPOLITAN CLEVELAND CONSORTIUM SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS HIGH SCHOOL (MC^2 STEM HIGH SCHOOL)

1. Selection of teachers and other CTU members at MC^{2}STEM High School will be based on interviews with the Personnel Selection Committee as defined in Article 12, Section 1(B) of the CBA, which shall include a parent representative and a community representative. All CTU bargaining unit members on the approved recall list meeting the minimum qualifications for an available position will be afforded the right to interview. Those members who choose not to be interviewed or who are not selected for employment will remain on the approved recall list. The principal and chapter chair shall agree to the total number of candidates to be interviewed and shall ensure that 50% of those interviewed be existing bargaining unit members, should sufficient member interest in the position exist. Selection will not be based on seniority.

2. MC^{2}STEM High School is designed to be a year-round school, operating from July 1 through June 30 each school year and including four 2 week vacation periods. For the 2009-10 school year bargaining unit members shall follow the attached academic calendar

    a. The duty day for the certificated CTU bargaining unit members assigned full-time to the MC^{2}Stem High School shall be four hundred seventy (470) minutes and the instructional day for certificated CTU bargaining members assigned to the MC^{2}Stem High School shall not exceed three hundred thirty (330) minutes. Total assigned time per week shall not to exceed 1650 minutes per week. CTU teachers are required to report fifty (50) minutes prior to the instructional day ON TUESDAY AND WEDNESDAY with the first forty (40) minutes used for school common planning time as assigned by the Head of School (Principal) or other administrator and the final ten (10) minutes during which bargaining unit members must be in the school building but which may not be assigned by the Principal or other administrator. CTU TEACHERS ARE REQUIRED TO REPORT TEN (10) MINUTES PRIOR TO THE START OF THE STUDENT SCHOOL DAY ON MONDAY, THURSDAY, FRIDAY AND ARE REQUIRED TO STAY ONE-HUNDRED AND TWENTY (120) MINUTES AFTER THE END OF THE REGULAR SCHOOL DAY ON THURSDAYS. The student instructional day for MC^{2}STEM High School will be from 9:00 A.M. through 4:00 P.M.

A1

TYPICAL WORK WEEK AS OUTLINED IN (A) ABOVE

Mon.	Tue.	Wed.	Thu.	Fri.
	50 min	50 min		
10 min	10 min	10 min	10 min	10 min
Student Day	Student Day	Student Day	Student Day	Student Day
			120 min	

b. All bargaining unit members, including extra support personnel (ESPs, related service personnel, itinerant special education teachers, and substitutes), will be paid at the appropriate daily instructional rate specified in the current Collective Bargaining Agreement (CBA) on all days of student instruction. This payment will reflect the additional calendar days and extended time for the days and times for which these bargaining unit members are assigned to the school. Teachers will be paid for an additional seventy (70) minutes per day at the daily rate. All professional development with the exception of July 6-31, 2009 (which includes student instruction) and those dates specified in the CBA shall be paid at the in-service instructor rate.

c. All contractual vacation periods, holidays and designed professional development days, including the two (2) voluntary professional development days, shall be recognized and observed as indicated on the attached calendar. The respective school remains responsible for planning these professional development days in accordance with Article 9, Section 2 of the CBA.

d. The workday for paraprofessionals assigned to the MC^{2}Stem High School shall be seven and three-quarter hours excluding lunch.

3. Teachers are required to collaborate with other teachers. Teachers shall be assigned to teaching teams. Teachers assigned to teaching teams shall be required to collaborate with team members in the planning, preparation and delivery of interdisciplinary units of instruction. Teaching will be based on a problem/project based model, and will require the use of differentiated instruction, flexible grouping, and non-traditional block scheduling strategies. This item supersedes the high school schedule in Article 9, Section 5(c) and Appendix K of the CBA.

4. Teachers will be required to collaborate with representatives from partnering institutions and higher education faculty to expand students' learning opportunities. The CTU teachers shall remain in charge of class as would any regular teacher. The CTU teacher shall be responsible for the student grades.

5. There shall be no traditional homerooms at the school. Accordingly, the approximate fifteen (15) minutes traditionally allocated to homeroom shall be utilized as advisory time or as specified in the AAP.

6. Each bargaining unit member will be required to participate in the student advisory activities that shall occur during the school day. The Head of School

(Principal) and UCC shall determine the procedures for such advisory activities on a written mutual agreement.

7. AAPs must be completed in the manner outlined in Article 5, Section 1 of the CBA.

8. The Senior Executive of the Office of New and Innovative Schools will serve in the role of Assistant/Regional Superintendent in all cases referenced in the CBA. The Head of School will serve in the role of principal/supervisor in all cases referenced in the CBA.

9. Bargaining unit members, as part of a regular assignment, shall be required to attend one out-of-school open house or other out-of-school event per semester which will be scheduled as one of the parent conference days as provided by state law and schools will be dismissed one half (1/2) day for students and teachers in accordance with that regulation. In addition, teachers shall be required to attend one additional out-of-school event per quarter. The Head of School (Principal) and UCC shall determine the calendar for such out-of-school events by written mutual agreement. Teachers will be paid at the In-service Instructor Rate for these mandatory out-of-school events. All other out-of-school events shall be voluntary.

10. Bargaining unit members may be required to participate in externships and/or supervision of student field experiences as part of the instructional day or as an assigned duty.

11. The school program site for MC^{2}STEM High School may be at a non-CMSD site.

12. The District and the CTU recognizes that all provisions in the 2007-2010 Collective Bargaining Agreement (CBA) between the District and the CTU as well as other binding agreements on the CTU and the District in the form of Memorandum of Understanding (hereinafter collectively CBA) shall remain in full force and effect.

13. This Memorandum shall remain in effect through the duration of the 2009/2010 school year, expiring on June 30, 2010.

_____
CMSD

_____
CTU

_____
7/6/09
Date

_____
7/6/09
Date
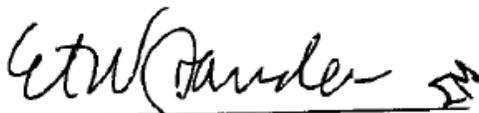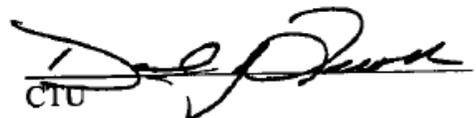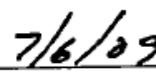
Senior class survey questions

Questions…

1. What successes have you had in your life?
2. What challenges have you faced in your life?
3. What resources have you used to succeed in life?
4. Please describe your life (one paragraph) during… Elementary School, Middle School and High School
5. What keeps you from quitting when things get really tough for you?
6. What was your life plan before coming to MC Squared?
7. What is your life plan now?
8. Describe your life at MC Squared?
9. How has MC Squared contributed to your life successes, challenges and plan?
10. Describe how your relationships at MC Squared have contributed to your life?
11. How do you anticipate your relationship being affected as you leave MC Squared?
12. When your peers ask you about the school what do you tell them?
13. Define the school in 5 words?

Group Interview Questions

Group Interview Questions:

- What advice would you give to younger students at the school?

- What would you change about the school?

- What tool did you learned at MC Squared that will help them in their future?

- Think about (name each year) and please share 1-2 experiences that shaped you.

- If you had to choose the three times in your high school career during which you were learning the most what would they be and why do you feel that they were so important to you?

- What other questions should I have ask you or should I ask during the interviews

Individual Interview Questions

General Introduction

- How did you choose MC Squared? GENERAL
- Tell me about your experience in school. GENERAL
- What have you liked doing the most? GENERAL
- What comes to mind and how valuable were each of these to your high school experience. when I say the word: GENERAL
    - Mastery
    - Flexible schedule
    - Internships
    - stem embedded campuses
    - year round calendar
    - capstones
    - activation
    - Biosphere2
    - pseop.
    - Master Your Own Path
    - Own Your Own Potential
- What advice would you give to younger students at the school? GENERAL

Personal Reflection

- What was your world like before you started attending school here? SOCIAL
- How would you say it has changed? SOCIAL
- Tell me about your family. What do they think of the school, what do they think of you? What role do you play in your family? SOCIAL/
- What is special about you as a person? What is special about you as a student? SOCIAL/MOTIVATION

Goal Valuation MOTIVATION (*suldo, Shaffer, shaunessy)*

- Do you feel like you work hard in school? Why or Why not? Please provide examples of when you have exhibited these behaviors.
- How important is it for you to get good grades in school? Why?
- What tool did you learned at MC Squared that will help them in their future? ACHIEVEMENT
- Please name the people you see as successful and why? SOCIAL/ACHIEVEMENT
- Who helps you make important decisions about your life? SOCIAL
- Who will you most remember from high school and why? SOCIAL

Adults at MC2 STEM High School SOCIAL (Bear, Gaskins, Blank, Chen)
- What types of things to you go to the adults at MC2 STEM for?
- Do you plan to stay in contact with any adults in your school after high school?
- What types of things would you stay in contact with them for?
- What have these relationships meant to you?
- Can you provide any specific examples of how these relationships have impacted your future?

Teachers SOCIAL (*Bear, Gaskins, Blank, Chen*)
- Do you like your teachers?
- Do you believe that adults in this school treat students fairly?
- Do teachers let you know when you are doing a good job?
- What have these relationships meant to you? SOCIAL
- Can you provide any specific examples of how these relationships have impacted your future? SOCIAL
- Has the staff turnover impacted you? If so, how? SOCIAL
- Has the staff turnover impacted the school? If so how? SOCIAL

Partners SOCIAL
- Can you name any professionals from STEM fields that you have had the opportunity to get to know while you have been in high school?
- What has that relationship meant to you?
- Do you plan to keep in touch with this person after you leave high school?
- What types of things would you stay in contact with them for?

Friends SOCIAL
- Who are your friends? SOCIAL
- How much time do you spend with your friends? SOCIAL
- What do/does these/this relations mean to your life? SOCIAL
- To what extent do you expect to stay in touch with these people post high school? SOCIAL
- What types of things would you stay in contact with them for? SOCIAL

Student–Student Relations SOCIAL
- Do students at this school really care about each other?
- How well do students at this school get along with one another?
- Do you feel like students treat each other with respect?
- Are students friendly towards most other students?

Student-Family of other student SOCIAL
- Do you have any relationships with other families in the school?
- If so, what this has meant to you?
- Do you plan to stay in contact with any of these families after high school?
- What types of things would you stay in contact with these families for?

School Connectedness: Social/Climate

- Do you feel like the school has provided you the opportunity to explore non-academic areas of interest?
- Can students impact decisions made at school?
- Do you like to hang out at school?
- Have you left your mark on this school? What is it?
- Has it left its mark on you? What is it?
- What has the school given to you over the past four years?
- What have you given to the school over the past four years?
- What specific social activities have you enjoyed the most and why? **SOCIAL**
- What is missing from your school's social environment? **SOCIAL**

Achievement

- What experience are you most proud of in your schooling? ACHIEVEMNT
- Think about (name each year) and please share 1-2 experiences that shaped you. ACHIEVEMENT
- What are your best skills that came from your experience at MC Squared? ACHIEVEMENT

Self-Management

- Putting aside the realities of your life, what degree would you wish to have when you finish school? SELF MANAGEMENT
- Given the realities of your life, what is the highest degree you expect to earn? SELF MANAGEMENT
- Do you ever feel physically unsafe? How do you handle these feelings?
- Do you ever feel emotionally unsafe? How do you handle these feelings?
- When you experience negative feelings at school what causes it and how do you deal with these feels? SELF MANAGEMENT
- Can you think of the one instance during your time here when you were the most satisfied? What was going on and why were you so satisfied? SELF MANAGEMENT
- Can you think of the one instance during your time here at school when you were the most upset? Why were you so upset and how did you handle it? SELF MANAGEMENT

General Conclusion

- If they could lock something away to makes sure you never lost it from these years at the school what would it be? and why? GENERAL
- Would you recommended the school to others and what would you say to them? GENERAL

- Would you encourage your younger family members to go to the school? GENERAL
- What would you change about the school and what tips they would have to help other kids be successful like they were? GENERAL
- Finally I would ask them what I should have asked that I have not asked. GENERAL
- Then I would ask them who else I should talk to about them and their experience. SOCIAL