

Systematic Plan for Replication of the Renzulli Academy for High Potential/Low Income Students

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Rationale

This proposal addresses the needs of a group of students in our Nation's schools who have, perhaps more than any other group, been overlooked and underserved despite massive efforts and expenditures to turn around the deteriorating state of schools that struggle to reverse the achievement gap. We define this group as High Potential/Low Income students (HP/LI), and they represent approximately 3 million young people from low-income families who score in the top quartile on their earliest achievement tests, but who also show a steady decline in subsequent year scores because of an under-challenging school experience. In other words, the longer they stay in school the less likely it becomes that they will maintain continuous progress toward their earlier demonstration of advanced level achievement!

A new report (Plucker, Hardesty, & Burroughs, 2013) published by the University of Connecticut provides considerable evidence that America has a permanent talent underclass. While a great deal of attention and resources have been focused on the achievement gap among low performing students almost no attention has been devoted to the "excellence gap" that exists among the highest achieving students. The report, which uses data from the National Assessment of Educational Progress and state assessments, shows that while the percentage of white students scoring at the advanced level in Grade 4 mathematics increased from 2.9% to 9% between 1996 and 2011, the percentage of high-scoring black students barely budged, reaching only 1.1% growth when compared with data reported in 2010. The report also tracked reading scores and compared high achieving American students' performance to their international peers, a comparison that found U.S. students lagging.

A similar report by the Philanthropy Roundtable (Smarick, 2013) reports that although some progress has been made for students at the low end of the achievement spectrum, students at the high end have gotten "lost in the shuffle." Programs and funding once aimed at stimulating high potential students to make the most of their talents have withered, and we are now doing a poor job at stimulating our quick learners. This squandering of talent potential among our nation's high potential/low income students has serious implications for America's future.

The loss of so many of these students is having a profound effect on college and career opportunities and the economic and professional advancement that usually results from an appropriately challenging education. Equally disturbing is the loss of human potential for the development of our nation's social and economic resources, the

progression of a minority middle class, the creation of larger numbers of positive role models, and all of the other attendant problems that result when persons of high potential turn their energy and abilities into negative directions. This loss of human capital is analogous to the ways in which our nation denied our most able young women equal opportunities a century ago.

We need not look far to understand why these HP/LI students fail to progress in school. Too many educators as well as policy makers have painted all low-income students with the same broad remedial brush and provided them with the same mind-numbing regimen of compensatory learning practices designed for low achievers. This approach to instruction has turned many of our schools into joyless places that promote endless boredom, lack of genuine student and teacher engagement, absenteeism, increased dropout rates, and other byproducts of an over-dependence on drill-and-practice learning. All of the failed solutions, usually launched with much fanfare, have been offered as silver bullets that can “save” our schools and raise the scores of our lowest achieving students. The sad fact is these strategies have not worked in general and have been especially devastating for high potential/low income students. In the process of trying to grind up test scores with a deficit-based pedagogy, educators have left HP/LI students sitting in classrooms, their abilities unrecognized and their opportunities for breaking the cycle of poverty unmet. In these classrooms, they experience an educational environment that is regularly characterized by boredom, disruption, and pressure to hide their talents and skills from unsympathetic and sometimes taunting peers. When all is said and done, it comes down to the sad fact that schools are not motivating HP/LI students; and most schools that serve this segment of the population are unmotivating places because they are far too standardized and committed to a weakness-based test prep approach to learning.

A Different Approach to Learning

This proposal is based on a different approach to learning for the HP/LI population. During the last 3 years, we conceived of and opened a school in Hartford, Connecticut in which we have recruited the highest scoring HP/LI students from across the city to attend an academy with its own faculty, facilities, and pedagogical model (Renzulli, 1977). A commitment was made by the Superintendent of Schools to obtain Board of Education approval and to provide financial support from the regular district budget. This commitment is especially important because externally funded initiatives seldom become sustainable at the conclusion of specified funding periods. Also approved was a principal who is responsible for teacher selection, student recruitment, curricular planning and supervision, parent orientation and involvement, and organizational and administrative duties. Both research and previous experience point out the crucial nature of strong leadership in this initiative. The school, named by central administration in Hartford, is called the Renzulli Academy, and the descriptions that follow point out the major areas upon which we have focused our effort to provide a different “brand” of learning for the Academy’s HP/LI students.

The approach that guides instruction at the Academy is based on a learning theory called the Enrichment Triad Model (Renzulli, 1977). This theory was originally developed to differentiate programs for gifted and talented students. Although the Enrichment Triad Model has become one of the most widely used designs in the world for gifted programs, we wanted the pedagogy embedded in Triad to provide opportunities to larger segments of the school population that often includes the HP/LI students who were not identified as gifted by the use of traditional measures. This concern about focusing on a broader spectrum of the school population resulted in the development of the Schoolwide Enrichment Triad Model (SEM; Renzulli & Reis, 1985).

The Replication Process

Our Schoolwide Enrichment Model Replication Process allows a school to implement the strategies and planning process used to develop the Renzulli Academy and other successful schools that use the SEM. The guidelines for replication are developed in a way that insures authentic and sustainable replicas of the Renzulli Academy and other highly successful SEM schools, but at the same time, allows for individual school initiatives, creativity, and respect for local regulations, resources, standards, and population demographics.

The focus of the SEM is to improve achievement, engagement, and enjoyment in *both* learning and teaching. The model is based on more than three decades of evidence based research and very positive feedback from numerous schools throughout the Nation that have used this easy-to-implement approach to school improvement (Reis & Renzulli, 1994). The “big picture” mission of the model is to prepare young people for successful entrance into competitive colleges and universities.

The SEM is an *infusion* based approach to school transformation. We do not criticize or recommend “throwing out” current practices. Rather, we examine current practice for maximum alignment with SEM goals and we provide training in specific organizational components and differentiated teaching strategies that can be infused into any and all curricular experiences that will make learning more engaging, enjoying, and challenging. SEM is based on the simple idea of using the proven, research-based pedagogy of gifted education to improve learning opportunities for HP/LI students. A central focus is on identifying the strengths of all students, differentiating instruction, and developing what are popularly called 21st century skills. These skills are a central part of our pedagogy and have been the main focus of our work for more than three decades. The SEM is not a rigid formula for school improvement. Each school develops its own plan and objectives around the common goals of achievement, enjoyment, engagement, and enthusiasm for learning. And each school devises its own unique means to pursue their goals. To learn more about the SEM and related research please visit our web sites at the following link: <http://www.gifted.uconn.edu/sem/semart.html>.

The replication process will be based upon an agreement with the school districts interested in replicating the Academy, the Neag Center for Gifted Education and Talent Development at the University of Connecticut, the Renzulli Academy, and other

selected schools that have already developed successful SEM programs. The following five major factors need to be considered by schools seeking to engage in the replication process:

1. District Buy-In Through Policy Adoption and Financial and Facility Support
2. Teacher and Leadership Selection and Training
3. SEM Student Selection Procedures
4. SEM Pedagogy and Selected Curricular Components
5. Development of a Plan for Formative and Summative Evaluation

Each of these factors is discussed below and will serve as focal points for discussion as planning of the replication process unfolds.

1. District Buy-In

Our experience has shown that new initiatives and externally funded programs seldom endure beyond the funding period or initial commitment to start a new program; and therefore, a major requirement is that all personal, instructional material, transportation, and facility costs are the responsibility of the school district. We also require approval by the superintendent of schools and the district board of education. Participation and approval by central office administrators has been demonstrated to be a positive feature of the Renzulli Academy and other successful SEM schools. Approval at these levels also helps to insure sustainability in the event of administrative changes.

Also crucial at the buy-in level is a principal that is totally versed in and committed to implementation of the programming model that focuses on a different “brand” of pedagogy than traditional approaches of developing high level of achievement and creative productivity in high-potential young people. One of the most important considerations in district buy-in is the ability to select teachers and provide the financial support for staff development that insures integrity to this brand of learning.

When Renzulli Academies are implemented as a school-within-a-school, school level buy-in is also important. Although the academy should have its own space and administration, friendly integration within the host school will help to minimize an us-and-them atmosphere. The academy may share services such as special classes (e.g., Music, Art, Physical Education), clubs and sports activities, cafeteria services, and common playground time; however it should have its own plan for scheduling, grading, dress codes, parent meetings and involvement. The most important requirement is that major subject area courses should be restricted to the targeted group of selected students.

It is important for the academy leader and faculty to promote positive relations with the host school principal and faculty. One of the ways that advances these positive relations with the host school and creates an atmosphere that supports enrichment opportunities throughout the entire school is for the academy leader to invite interested host school faculty to participate in on-site staff development provided by the academy.

Any other opportunities to minimize an “us-and-them” atmosphere should be explored. Thus, for example, if the academy invites a speaker to make a presentation on a particular topic (e.g., Robotics, Poetry, Origami, etc.) an invitation to other teachers to send a student or two with *highly demonstrated interest* in this topic will certainly help to build school-level buy-in.

2. Teacher and Leadership Selection and Training

A key ingredient to the success of the Academy and other successful SEM schools has been careful selection and training of teachers and the person who serves as the principal or lead teacher. All personnel have been selected because of an exemplary record of the type of teaching and learning that is compatible with the pedagogy underlying the academy’s instructional program (discussed below) and a willingness to participate in training programs provided by the University of Connecticut’s Neag Center for Gifted Education and Talent Development. This training consists of courses (online and/or on campus courses), on-site staff development and mentor assistance, short internships at the academy and other successful SEM schools, webinars, and attendance at our annual summer institute on enrichment teaching and learning. The major use of funds requested in this proposal is for program planning and the preparation of teachers and administrative personnel.

3. SEM Student Selection Procedures

Our student selection procedures are based on a case study examination of a combination of the following criteria:

- a. Scores on Standardized Achievement Tests
- b. Teacher rating scales that examine characteristics related to Learning, Motivation, and Creativity
- c. Student self-ratings and short essays that provide insight into social and emotional factors such as Self-Regulated Learning, Independence, Interpersonal Relationships, Impulse Control, Optimism, Flexibility, and Problem Solving
- d. Teacher ratings on the Direct Behavior Rating Scale (DBR), which examines Academic Engagement, Respectfulness, and Disruptive Behavior (Chafouleas, Riley-Tillman, Christ, & Sugai, 2009)

4. SEM Pedagogy and Selected Curricular Components

The SEM pedagogy is based on a theory of learning called the Enrichment Triad Model. The major assumptions underlying the model are:

1. Each learner is unique and therefore, all learning experiences must be examined in ways that take into account the abilities, interests, and learning styles of the individual.

2. Learning is more effective when students enjoy what they're doing, and therefore, learning experiences should be constructed and assessed with as much concern for enjoyment as for other goals.
3. Learning is more meaningful and enjoyable when content (knowledge) and process (thinking skills and methods of inquiry) are learned within the context of a real and present problem, and therefore, attention should be given to opportunities to personalize student choice in problem selection, the relevance of the problem for individuals and for students who share common interests in the problem, and strategies for assisting students in personalizing problems they might choose to study.
4. Some formal instruction may be used in high-end learning, but a major goal of this approach to learning is to enhance knowledge and thinking skills acquisition gained through teacher instruction with applications of knowledge and skills that result from students' construction of meaningfulness.

The ultimate goal of learning that is guided by these principles is to replace dependence and passive learning with independence and engaged learning. The most difficult part of enrichment learning and teaching is getting teachers to modify their instructional practices by becoming facilitators of learning—the proverbial “guide-on-the-side” rather than the disseminator of information. The teacher’s role is to assist in problem finding and problem focusing, the procurement of content and methodological resources through the appropriate use of technology, and to help students understand how to use these resources. Direct instruction takes place, but is modified in ways that personalize learning based on individual or small group interests, learning styles, academic strengths, and preferred modes of expression. Direct instruction also is provided, when necessary, to help produce and improve their products, presentations, or services.

The Theory Underlying the Curriculum and Pedagogy at the Renzulli Academy

For high-end learning or enrichment learning and teaching to be systematically applied to the learning process in the regular classroom it must be organized in a way that makes sense to students and teachers. An organizational pattern called Enrichment Triad Model (Renzulli, 1977) is used for this purpose. Three types of enrichment are used to infuse higher level learning opportunities into regular curricular material and enrichment situations. Type I enrichment consists of general exploratory experiences that are designed to expose students to topics in areas of study not ordinarily covered in the regular curriculum. Type I Enrichment exposes students to potential interests through vehicles such as guest speakers, field trips, demonstrations, interest centers, and the use of audiovisual materials and technology (such as webinars) designed to expose students to new and exciting topics, ideas, and fields of knowledge. The main purpose of Type I is to stimulate motivation for potential follow-up in a Type II or III direction.

Type II enrichment consists of group training in thinking and feeling processes; learning-to-learn skills; research and reference skills; and written, oral, and visual communications skills. Type II Enrichment includes instructional methods and materials

purposefully designed to promote the development of thinking, feeling, research, communication, and methodological processes. Type II training, usually carried out both in regular classes and in specially arranged enrichment experiences, includes the development of creative thinking and problem solving, critical thinking, and affective processes. Type II Enrichment also can serve as a vehicle for stimulating Type III follow-up on the parts of individuals or small groups who share a common interest.

Type III enrichment consists of first-hand investigations of real problems. Problem solving in real life almost always results in a product or service that has a functional, artistic, or humanitarian value. The learning that takes place in a real problem situation is collateral learning that results from attacking a problem and applying the skills mentioned above to produce a product or service. Type III Enrichment is the most advanced level in the Triad Model. Although Types I and II and curriculum compacting should be provided on a regular basis to all students, the ability to revolve into Type III Enrichment depends on an individual's interests, motivation, and desire to pursue advanced level study. Type III Enrichment is defined as investigative activities and artistic productions in which the learner assumes the role of a first-hand inquirer thinking, feeling, and doing like a practicing professional, even if at a more junior level than adult professionals. Our general goal for Type III is to enhance self-regulation and self-efficacy by having young people pursue advanced or professional level work at as high a level as possible given the student's age, level of development, and the availability of human and material resources. The most important feature of the Triad Model is the "flow" or connection between and among the three different types of enrichment experiences. Each type of enrichment is viewed as a component part of a holistic process that blends present or newly developed interests (Type I) and advanced level thinking and research skills (Type II) with application situations based on the *modus operandi* of the first-hand inquirer (Type III). This approach, popularly referred to in the psychometric literature as "performance-based assessment," allows all students the opportunity to pursue a more personalized type of higher-level learning.

Curriculum Compacting

Curriculum compacting also is offered to all Academy students. Teachers modify the regular curriculum by eliminating portions of previously mastered content when students show strengths in these areas (Reis, Burns, & Renzulli, 1992). This elimination or streamlining of curriculum enables these high potential students to avoid repetition of previously mastered work and guarantees mastery while simultaneously creating time for more appropriately challenging activities (Reis et al., 1992; Renzulli, Smith, & Reis, 1982). Compacting is used to document the content areas students have been mastered and the alternative work that has been pursued. The Enrichment Triad Model offers the three types of enrichment experiences described above for students who have gained time through the curriculum compacting process. Compacting plus enrichment opportunities have been responsible for eliminating the boredom often experienced by students who can cover regular curricular material at a faster pace than their peers.

Major Curricular Components and Services

Renzulli Learning

Students at the Academy receive several kinds of services that are a part of the SEM. First, interest, learning styles, and product style assessments are conducted using a technology-based assessment program called Renzulli Learning System (RLS) (<https://renzullilearning.com>). Each student receives an electronic profile that identifies his/her unique strengths and talents and teachers can identify patterns of student's interests, products, and learning styles. These methods are being used to both identify and create students' interests and to encourage students to develop and pursue these interests in various ways. Learning style preferences assessed include projects, independent study, teaching games, simulations, peer teaching, programmed instruction, lecture, drill and recitation, and discussion. Product Style preferences include the kinds of activities students like to do such as hands-on projects, artistic creations, displays, dramatizations, and service and multimedia projects as well as traditional written and oral modes of expression.

The RLS is a research-based component of the SEM that was developed by the University of Connecticut Research and Development Corporation. Field (2009) studied the use RLS, an innovative online enrichment program based on the Enrichment Triad Model, for students in both an urban and suburban school. In a 16-week experimental study, both gifted and non-gifted students who participated in the use of RLS for 2–3 hours each week demonstrated significantly higher growth in reading comprehension than the control group students who did not participate in the program. Students also demonstrated significantly higher growth in oral reading fluency and in social studies achievement than those students who did not participate (Field, 2009).

Four components of the RLS enable students to have access to enrichment during the day as well as after school and at home if the technology is available in their homes. The first step consists of a computer-based diagnostic assessment that creates a profile of each student's academic strengths, interests, learning styles, and preferred modes of expression. The online assessment, which takes about 30 minutes to complete, results in a personalized profile that highlights individual student strengths and sets the stage for step two of the RLS. The profile serves a compass for the second step, which is a differentiation search engine that examines thousands of resources that relate specifically to each student's profile. Student profiles can also be used to form groups of students who share common interests. A project management tool guides students and teachers to use specifically selected resources for assigned curricular activities, independent or small group investigative projects, and a wide variety of challenging enrichment experiences. Another management tool enables teachers to form instructional groups and enrichment clusters based on interests and learning style preferences. Teachers have instant access to student profiles, all sites visited on the web, and the amount of time spent in each activity. Parents may also access their own child's profile and web activities. To promote parent involvement, we suggest that students actually work on some of their favorite activities with their parents.

Next, the differentiation search engine matches student strengths and interests to an enrichment database of 50,000 enrichment activities, materials, resources, and opportunities for further study that are grouped into the following categories: virtual field trips, real field trips, creativity training, critical thinking, projects and independent study, contests and competitions, websites, fiction and non-fiction books, summer programs, online activities, research skills, and high interest videos and DVDs. These resources are not merely intended to inform students about new information or to occupy time surfing around the web. Rather, they are used as vehicles to help students find and focus a problem or creative exploration of personal interest to pursue in greater depth. Many of the resources provide the methods of inquiry, advanced level thinking and creative problem solving skills, and investigative approaches. Students are guided toward the *application of knowledge* to the development of original research studies, creative projects, and action-oriented undertakings that put knowledge to work in personally meaningful areas of interest, and provide students with suggestions for outlets and audiences for their creative products. The resources available in step two also provide students with opportunities to pursue advanced level training in their strength areas and areas of personal interest.

The third part of RLS for students is a project organization and management plan called The Wizard Project Maker. Using this project planner, teachers can help students target their web-based explorations to undertake original research, investigative projects, and the development of a wide variety of creative undertakings. The sophisticated software used in this tool automatically locates potentially relevant web-based resources that can be used in connection with the student's investigative activity. This management device is designed to fulfill the requirements of a Type III Enrichment experience, which is the highest level of enrichment described in our discussion of the Enrichment Triad Model. Specifically, the Wizard Project Maker provides students with the metacognitive skills to define a project and set a goal; identify and evaluate both the resources to which they have access and the resources they need (e.g., time, Internet sites, teacher or mentor assistance); prioritize and refine goals; balance the resources needed to meet multiple goals; learn from past actions, projecting future outcomes; and monitor progress, making necessary adjustments as a project unfolds. The Wizard Project Maker helps students make the best use of web resources, helps to focus their interests as they pursue advanced level work, and establishes a creative and viable responsibility for teachers in their role as "the guide on the side." By helping students pursue advanced levels of challenge and engagement through the use of the Wizard Project Maker, we hope students will begin to regard their teachers as mentors rather than just as disseminators of knowledge.

The final step in the Renzulli Learning System is an automatic compilation and storage of all student activity from steps one, two, and three into an on-going student record called the Total Talent Portfolio. A management tool allows students to evaluate each site visited and resource used, students can complete a self-assessment of what they derived from the resource, and if they choose they can store favorite activities and resources in their portfolio. This feature allows easy-return-access to on-going work. The portfolio can be reviewed at any time by teachers and parents through the use of an access code, which allows teachers to give feedback and guidance to individual

students and provides parents with information about students' work and opportunities for parental involvement. The Total Talent Portfolio will travel with students throughout their years at the Academy to serve as a reminder of previous activities and creative accomplishments that they might want to include in college applications and it is an ongoing record that can help students, teachers, guidance counselors, and parents make decisions about future educational and vocational plans.

Another component of the RLS is the Personal Success Plan (PSP). This plan is designed to help students think about their futures by exploring and identifying strong areas of interest, identifying the characteristics of heroes, helpers, and careers, and setting future academic and career goals and the means to achieve these goals. The PSP introduces students to a variety of project ideas and careers, both traditional and unique, and guides them to websites for further exploration related to attainable goals and career paths. This vehicle is designed to help students think, plan, and identify the school components of their education that will assist them toward college matriculation.

Teacher resources in RLS enable teachers to differentiate assignments, and send tiered and compacted assignments to students by placing them in their electronic talent portfolio. Teachers can also use RLS to group students based on their interests, learning, and expression or product styles.

Odyssey Learning

Compass Learning Odyssey is an online component to meet the needs of our high potential students while offering personalized instruction. Compass Learning creates curriculum and assessments that help to motivate students to engage, think, and learn based on their individual academic assessments. The curriculum is developed through research-based instruction with special attention to individual strengths and areas in need or remediation. Each student is assessed for understanding of key objectives and based upon those results a completely personalized learning path is created with engaging activities. Compass Learning utilizes blended learning, combining online and in-person learning. This approach allows for students and teachers to benefit from the strengths of the interpersonal and personalized instruction a teacher can give while also gaining in depth knowledge from experts in the field who have helped in creating each curriculum option on Compass Learning.

Enrichment Clusters

Enrichment clusters, another component of the SEM, are targeted for groups of students who share common interests, and who are grouped together during specially designated time blocks to work with an adult who shares their interests and who has some degree of advanced knowledge and expertise in the area. A series of clusters are planned and implemented for all students in the Academy. Students complete an interest inventory on the RLS website, which also assesses their preferred learning and expression styles and academic strength areas. The results from this inventory as well as the students' choices allow for placement in a cluster that will engage and motivate each student. An enrichment coordinator tallies all of the major interest areas and then

recruits teachers and other professionals in the school to facilitate enrichment clusters based on these interests. Past clusters in the Academy have included: sign language, dance, poetry, geography, stamp collecting, Zumba, autobiographical writing, scrapbooking, and drawing. Students are placed in their top choices for the clusters and scheduling is completed to place all children into their first, or in some cases, second choice. Research has also suggested that the use of enrichment clusters results in higher use of advanced thinking and research skills (Reis, Gentry, & Maxfield, 1998). The cluster time at the Academy has become a cornerstone of student engagement. Clusters have allowed for these HP/LI students to be exposed to a variety of activities and ideas that are not covered as in depth in the regular curriculum.

Supplementary Enrichment Experiences

One of the supplementary services of the Academy is a series of outreach initiatives to surrounding businesses and organizations. Teachers talking with interested community members and remaining in touch to help coordinate initial visits to the Academy have facilitated this cooperative approach. It has been the experience of the staff that once community members are involved there is an intrinsic connection that is formed with the students. An example of our supplemental enrichment experiences includes the Talcott Mountain Science Center, The Bushnell Center for the Performing Arts, The Connecticut Science Center, The Connecticut Historical Society, Connecticut Public Television, and the Connecticut Association for the Gifted.

We will work with each of the replication sites to help them explore and make contact with these types of enrichment resources. Through these types of supplemental community collaborations we have been able to offer the kinds of experiences that are not ordinarily available to low-income children. This support points out how community involvement and support can extend enrichment opportunities on a broader scale beyond those available through our regular curriculum.

The Academy also promotes high engagement in learning and a focus on the application of knowledge by requiring all students to engage in at least one academic competition during their time in our school. This work is carried out in enrichment clusters and as well as through regular curriculum extensions. Programs such as the Connecticut Invention Convention, National History Day, Odyssey of the Mind, and the National Geography Bee are examples of opportunities for students to apply their cognitive, motivational, organizational, and interpersonal skills to self-selected areas of academic performance. Participation in these events highlights the relevance and application of academic studies and greatly increases the motivation to bring their work to high levels of excellence.

Supplementary enrichment also includes setting target levels for the number of fiction and non-fiction books read each year. All students are required to maintain a personal reading log and participate in individual conferences with their teachers to insure maximum benefit from supplementary reading requirements. Guidance by teachers insures that all self-selected books are at a challenge level that promotes continuous growth in basic reading skills.

Regular Curriculum and Instructional Programming

The curriculum and instructional program adopted for the Academy combined the philosophy and work of Renzulli and Reis (1997) and the work of Sandra Kaplan's (2009) approach to adding depth and complexity for gifted and high potential students. The SEM was infused across all content areas as both enrichment and opportunities for independent and small group study were used to enrich and extend the regular content curriculum across the content areas. Each content area curriculum combined the depth and complexity advocated by Kaplan (2009) with the ideas included in the Multiple Menu Model (Renzulli, Leppien, & Hays, 2000).

Mathematics

Students in the Renzulli Academy participate in an advanced mathematics curriculum called Project M³, Mentoring Mathematical Minds (Gavin et al., 2007; Gavin, Casa, Adelson, Carroll, & Sheffield, 2009). This program emerged during a collaborative research effort coordinated by Dr. M. Katherine Gavin, a faculty member at the University of Connecticut, and researchers from other universities comprising a team of national experts in the fields of mathematics, mathematics education, and gifted education. The team created 12 curriculum units of advanced mathematics. Using a project-based approach, Project M³ offers depth and complexity of math concepts taught across grade levels to high-ability students. The program was field tested over the last several years and includes advanced math curriculum with projects and investigations to foster creativity, critical thinking, and problem-solving skills that lead to higher math and problem solving scores than comparison group students (Gavin et al., 2009). For example, in place value, students move beyond using tens, hundreds, and thousands and take part in a simulated archaeological dig, where they will discover unusual calculations carved into rock. Using creative problem solving skills, students are asked to determine which place value system was used by these people.

When necessary, the Hartford schools' math standards were integrated into the Project M³ curriculum. For students who mastered the Hartford math standards, their curriculum was compacted and more advanced activities were available with Project M³. Flexible cluster grouping also was initially used across the three grade levels to place students in a non-graded mathematics to participate in the open-ended problem solving opportunities that are inherent in Project M³.

Reading/Language Arts/Writing

The Schoolwide Enrichment Model in Reading (SEM-R; Reis & Boeve, 2009; Reis et al., 2007, 2008, 2011) also has been integrated into the Renzulli Academy as the core of the reading/language arts (LA) program. This approach, developed by Dr. Sally Reis and a team of reading and gifted education specialists, focuses on reading acceleration and enrichment for talented readers through engagement in challenging, self-selected reading, accompanied by instruction in high-level thinking and reading strategy skills. A second core focus of the SEM-R is differentiation of reading content and strategies, coupled with more challenging reading experiences and advanced

opportunities for metacognition and self-regulated reading (Housand & Reis, 2008). In other words, the SEM-R program challenges and prepares students who are talented in reading to begin reading more challenging books in school and to continue this reading at home.

The goals of the SEM-R approach are to encourage children to begin to enjoy the reading process by giving them access to high-interest, self-selected books that they can read for periods of time at school and at home; to develop independence and self-regulation in reading through the selection of these books as well as the opportunity to have individualized reading instruction; and, finally, to enable all students to improve in reading fluency and comprehension through the use of reading comprehension strategies.

The SEM-R intervention includes three phases. During Phase 1, the “exposure” phase (also known as a “book hook”), teachers present short read-alouds from high quality, engaging literature to introduce students to a wide variety of titles, genres, authors, and topics. Along with these read-alouds, teachers provide instruction through modeling and discussion, demonstrating reading strategies and self-regulation skills and using higher-order questions to guide discussion. Early in the SEM-R at the Renzulli Academy, these Phase 1 activities lasted about 20 minutes per day; Phase 1 decreased in length over the course of the year when students could spend more time on Phase 2. Currently, all students read for about 50–60 minutes each day.

Phase 2 of the SEM-R emphasizes the development of students’ ability to engage in supported independent reading (SIR) of self-selected, appropriately challenging books, with differentiated instructional support provided through conferences with the teacher or another adult. During Phase 2, students select books that were at least 1 to 1.5 grade levels above their current reading levels. Students learned strategies for recognizing appropriately challenging books, and they were guided and encouraged to select challenging books in areas of their interest to promote engagement. Over the course of the intervention, students initially read for 5–15 minutes a day during Phase 2; over time they extended SIR to 20–25 minutes, and finally to almost an hour each day. During this in-class reading time, students participate in individualized reading conferences with their teachers; on average, each student participated in one to two conferences per week, and conferences usually lasted about 5–7 minutes. In these conferences, teachers and instructional aides assessed reading fluency and comprehension and provided individualized instruction in strategy use, including predicting, using inferences, and making connections. For more advanced readers, conferences focused less on specific reading strategies and more on higher-order questions and critical concepts.

In Phase 3, students are encouraged to move from teacher-directed opportunities to self-choice activities over the course of the intervention. Activities include (but were not limited to) opportunities to explore new technology, discussion groups, practice with advanced questioning and thinking skills, creativity training in language arts, learning centers, interest-based projects, free reading, and book chats. These experiences provide time for students to pursue areas of personal interest

through the use of interest development centers and the Internet to learn to read critically and to locate other reading materials, especially high-quality, challenging literature. Options for independent study using RLS are also made available for students during Phase 3. The length of Phase 3 varies with the length of the other phases, with more or less time devoted to Phase 3 on particular days based on progress in independent reading and needs for time to be devoted to independent projects and activities. All students in the academy have one period each day for an independent study/type III block connected to SEM-R that also incorporates philosophy of the school.

All teachers receive approximately 350 high interest books across several reading levels to support their SEM-R implementation and the teachers augmented their collections as needed, choosing literature based on students' interests and experiences. Teachers also received sets of bookmarks with higher-order questions that are free and available for download at <https://gifted.uconn.edu/semr-about/>. Each bookmark includes about 3–5 questions addressing a particular literary element, theme, genre, or other area of study and is tied to advanced reading strategies as well as state standards. Teachers use the bookmarks in both Phase 1 discussions and Phase 2 conferences to promote higher-order thinking. Using the SEM-R, students also complete advanced writing selections on a weekly basis. Based on almost a decade of research, the SEM-R has been proven to be effective at increasing achievement in reading and encouraging talented readers to read more challenging material for longer periods of time. Results of randomized studies suggest it is even more effective for urban talented students (Reis et al., 2008) and for students who speak English as a second language (Reis & Housand, 2009).

Science

The science curriculum is based upon challenging standards and big ideas, applied to units of study across the grade levels. Using both the Multiple Menu Model (Renzulli et al., 2000) and Kaplan's (2009) work, a curriculum map was created with essential questions and big ideas across content area units such as habitats and the water cycle. Science units also introduce inquiry-based work that employs the scientific method. Students begin by studying key concepts and principles in science based on grade level standards and then depth and complexity will be added to enable students to work actively on science projects by forming a hypotheses and applying the scientific method to inquiry-based learning and hands-on experiences in science. Enrichment is scaffolded across each of these units with Type I, II, and III opportunities in science. The goal each year is for students to complete an advanced science project in an area of interest using data collection methods and the scientific method.

Social Studies

Social Studies is taught by adding depth and complexity to the grade level standards, infusing enrichment into the content area using the Enrichment Triad Model (Renzulli, 1977), and requiring a project based on advanced content acquisition, primary sources, and interests each year. A curriculum map has been developed for each grade

level, with the goal of enabling these academically talented students to demonstrate and/or acquire knowledge of the grade level social studies curriculum; as well as to engage in authentic historical research. Units of study on the curriculum map include the following, among others: explorations about Native Americans, Connecticut history, geography and map skills, and government. A focus on big ideas is integrated into these units that also introduce students to critical thinking and problem solving skills. A social studies project is required annually during the second semester of each year, culminating with a History Day project during sixth grade. In fourth grade, for example, students are required to complete a research project about a significant person or place in Connecticut history incorporating the use of primary sources and at least one big idea introduced during the year. The products can be expressed in students' areas of strength and choice, such as dramatic, written, display, technological, auditory, or in any combination of student preferences to be completed during the last marking period of fourth grade. Beginning in sixth grade, advanced themes from the National History Day Competition are integrated with standards based instruction and all students complete an historical project of sufficient quality that it can be submitted to the regional competition.

Co-Cognitive and Affective Development

Social Emotional Adjustment

A comprehensive review of research (Neihart, Reis, Robinson, & Moon, 2001) found that high-ability students are generally at least as well adjusted as any other group of youngsters, suggesting that most talented students do not face any more social and emotional problems than do other students. One exception to this statement is those creatively gifted adolescents, such as those talented in writing or the visual arts, have been found to manifest significantly higher or lower rates or severity of depression than those for the general population (Neihart et al.). This review also found that gifted and talented students face a number of situations that, while not unique to them, constitute sources of risk to their social and emotional development if their needs are not met (Neihart et al.). One example of these risks is underachievement, widely regarded as one of the most pervasive problems affecting this population (Reis & McCoach, 2000), and in research conducted in the city in which the academy is housed, underachievement of gifted students at the high school level was found to be approximately 50% (Reis & Purcell, 1993).

The students identified for the Renzulli Academy are definitely at risk for underachievement, as they have been in under-challenging classrooms and schools, faced peer pressure for conformity to minimal effort, and some have faced social isolation as they leave their neighborhood schools and friends to attend a new school. Some also face family dysfunction as they have lost siblings to deaths from gunshots and parents to drugs, crime, and prison. Unfortunately, the pattern of underachievement is difficult to reverse and can persist into adulthood without intervention (Reis & McCoach, 2000) and so attempts to reverse any trend we have seen are proactive and immediate. These students may also encounter barriers to racial identity development particularly if they feel they must choose between academic success and social

acceptance (Ford, 2002; Neihart et al., 2001). The most pervasive problems we have experienced have been the absence of self-regulation to focus for long periods of time and to learn how to garner their own resources to expend the effort required for challenging work.

For students to make adequate academic progress attention must also be given to the development of traits that contribute to effective learning. These traits represent a broad range of characteristics that contribute to social and emotional development, the development of learning-how-to-learn skills, organizational and time management skills, and the ability to work effectively with others. They include self-regulation, character development, and executive function skills such as organization, planning, deferred gratification, etiquette, and consideration of others.

Self-Regulation

For purposes of our discussion, self-regulation is an integrated learning process, consisting of the development of a set of constructive behaviors that affect one's learning. These processes are planned and adapted to support the pursuit of personal goals in changing learning environments. According to Zimmerman (1989), self-regulated learning involves the regulation of three general aspects of academic learning. First, self-regulation of *behavior* involves the active control of the various resources students have available to them, such as their time, their study environment (e.g., the place in which they study), and their use of others such as peers and faculty members to help them (Garcia & Pintrich, 1994; Pintrich & De Groot, 1990). Second, self-regulation of *motivation and affect* involves controlling and changing motivational beliefs such as self-efficacy and goal orientation, so that students can adapt to the demands of a course. In addition, students can learn how to control their emotions and affect (such as anxiety) in ways that improve their learning. Third and finally, self-regulation of cognition involves the control of various cognitive strategies for learning, such as the use of deep processing strategies that result in better learning and performance than students showed previously (Garcia & Pintrich, 1994). Within days of the school starting, as we had expected, we found that many of these talented students lacked all three aspects of self-regulation.

We believe that these academically talented students can be taught to become more self-regulated learners by acquiring specific strategies that work for them and enable them to increase their control over their own behavior and environment. This means that students learn to decrease negative behaviors and increase positive behaviors. Therefore, students who are self-regulated must learn to continually ask themselves "Does this strategy work for me in this situation?"

To self-regulate, students must shift their focus from comparing their performance to peers to self-comparisons, and from being reactive to being proactive learners. Self-regulated behavior is designed to decrease the discrepancy between ideal and desired goals. Goals direct activities and students must learn not only that there are different ways to attain goals, but also how to select the best way to complete

a specific task. In many classrooms, teachers assume most of the responsibility for the learning process and students may begin to depend on this model of learning.

Current research indicates that some gifted students possess better self-regulated learning strategies than their peers however some gifted students may have done very well in school without using good self-regulation strategies because of a combination of their high abilities and/or an unchallenging curriculum (Zimmerman, 1989, 1990). If learning is relatively easy for someone, less effort, organization and other self-regulated activities are expended. Social conditions or personal issues prevent some HP/LI students from developing self-regulated learning strategies. For some students who already have gained some of these strategies, social or personal issues may prevent them from using them regularly, and thus, they need to be helped and encouraged to do so. Some gifted and talented students also display perfectionism and need to learn to strive for excellence (their personal best) rather than not start work for fear that they will not reach the level of perfection they deem necessary. Some talented students with high potential may find it difficult to learn self-regulation when it is not taught, modeled, or rewarded by the adults in their home and family. Even if students interact regularly with adults who demonstrate self-regulation, they may fail to use these skills themselves due to peer pressure or refuse to use the strategies their parents or teachers regularly employ at home or school.

Compared with low achieving students, high achievers set more specific learning goals, use a variety of learning strategies, self-monitor more often, and adapt their efforts more systematically (Zimmerman & Pons, 1986). The quality and quantity of self-regulation processes is crucial. We must recognize that one self-regulation strategy will not work for all students, and that the use of only a few strategies will not work optimally for a person on all tasks or occasions. It is important that students learn to use multiple self-regulatory learning skills rather than single strategies. They must also learn that their goals and their choice of self-regulation strategies have to be continually adjusted.

Character Development and Executive Functions

A final area that is important at the Academy is a focus on character development and the acquisition of skills that enable students to use their academic skills to pursue a desired goal in an efficient and effective way. We sometimes describe this final area as simply “getting your act together.” The most creative ideas, advanced analytical skills, and the noblest of motives may not result in positive action unless leadership skills such as organization, sequencing, and sound judgment are brought to bear on problem situations. Landmark research by Duckworth and Seligman (2005) has shown that students who persist in college were not necessarily the ones who excelled academically, but the ones with exceptional character strengths such as optimism, persistence (“grit”), and social intelligence. This research showed that measures of self-control can be more reliable predictors of students’ grade-point averages than their IQ scores. Including this focus in our work represents a distinctly different approach to school reform than most of the traditional school improvement models. Both IQ and self-discipline are correlated with GPA, but self-discipline is a much more important contributor: those with low self-discipline have substantially lower grades than those

with low IQs, and high-discipline students have much better grades than high-IQ students. Even after adjusting for the students' grades during the first marking period of the year, students with higher self-discipline still had higher grades at the end of the year. The same could not be said for IQ. Further, the study found no correlation between IQ and self-discipline—these two traits varied independently.

Our work in this area has been an investigation into what are commonly referred to in the business world as executive functions. Executive functions are broadly defined as the ability to engage in *novel* situations that require planning, decision-making, troubleshooting, and compassionate and ethical leadership that is not dependent on routine or well-rehearsed responses to challenging combinations of conditions. These traits also involve organizing, integrating, and managing information, emotions, and other cognitive and affective functions that lead to “doing the right thing” in situations that do not have a predetermined or formulaic driven response. These functions are especially important to highly capable people because of the positions of power to which they typically ascend.

A number of researchers have pointed out the importance of incorporating these non-cognitive skills into everything from curricular experiences (Bodrova & Leong, 1996; Diamond, 2010) to educational assessments (Levin, 2011; Sedlack, 2005) and college admission considerations (Sternberg, 2005). These skills have important implications for the academic success of students, career decisions, and even the economic productivity of nations. While not minimizing the importance of traditional cognitive ability, these authors point out that conventional assessments account for a small portion of the variance when examining long term academic and career accomplishment, especially as it relates to the advancement of adult competencies in highly demanding professions where leadership skills and creative productivity are the criteria for success.

A good deal of the background material that led to the inclusion of executive functions in this overall talent development model comes from the field of human resources (Durlak, Weissberg, Dymnicki, Taylor & Schellinger, 2011; Heckman & Rubenstein, 2001). These authors point out the importance of non-cognitive skills in personal and social as well as academic development and, more importantly for this overall theory, a meta-analysis showed that these skills can be taught. Initial input was also derived from the literature on social, behavioral, and what Goleman (2006) called emotional intelligence. Goleman argued that great leadership works through non-cognitive traits such as Self-Awareness, Self-Management, Motivation, Empathy, and Social Skills. Although the research literature on these types of non-cognitive traits is massive, there is general agreement the following so-called Big Five (Almlund, Duckworth, Heckman, & Kautz, 2011) are the basis around which education intervention programs should focus:

1. **Openness**—inventive and curious as opposed to consistent and cautious;
2. **Conscientiousness**—efficient and organized as opposed to easy-going and careless;
3. **Extraversion**—outgoing and energetic as opposed to solitary and reserved;

4. **Agreeableness**—friendly and compassionate as opposed to cold and unkind;
5. **Neuroticism**—chronic level of emotional stability and proneness to psychological distress as opposed to predictability and consistency in emotional reactions.

Our research to date on this sub-theory has included the development of an instrument called *Rating the Executive Functions of Young People* (Renzulli & Mitchell, 2011). The instrument is designed to assist in research dealing with the types and degrees of executive function traits in young people. The instrument is intended to be diagnostic in nature and can be used both to identify potential leadership traits in young people and help teachers determine which curricular experiences can be provided to develop desirable leadership traits in individuals or groups. Subsequent diagnostic techniques may include simulations to determine successful performance in demanding problem-solving situations.

The initial review of research identified several constructs including mindfulness, ethical/moral, social, motivational, and leadership traits as well as the so called Big Five personality traits or factors mentioned above. Also identified were specific traits such as being eager to learn, studious, intelligent, interested, and industrious and other variables such as positive and realistic self-appraisal, preference for long-range goals, successful leadership experience, and community service. Researchers in other domains have also identified non-cognitive variables of persons who lead and make a difference. For example, in reports on the characteristics possessed by some of the most altruistic persons in American society, common traits that were demonstrated by most of these individuals including passion, determination, talent, self-discipline, and faith. Leadership, ethics, accountability, adaptability, personal productivity, personal responsibility, people skills, self-direction, and social responsibility have also been identified as critical skills in the literature dealing with 21st century skills, as were professionalism, enthusiasm, leading, positive work ethic, values, deciding, teamwork, character, supporting, conforming, openness, self-concept, anxiety, and life-long learning.

This overwhelming list of traits that emerged from the literature review has been grouped into five general categories as a result of a factor analysis conducted with several hundred respondents using the instrument mentioned above. The first factor is Action Orientation, which includes specific characteristics that motivate an individual to succeed. The second factor is Social Interactions and it includes traits that enable someone to successfully interact with others. The third factor is Altruistic Leadership, and it includes characteristics relating to both empathy and dependability. The fourth factor is called Realistic Self-Assessment and it includes characteristics that demonstrate awareness of one's own abilities, realistic self-appraisal, and self-efficacy. The fifth factor, Awareness of the Needs of Others, demonstrates sensitivity, approachableness, and strong communication skills. Taken collectively, all of these behaviors reflect not only the characteristics of highly effective persons, but also include traits that cause people who have emerged as leaders in their respective fields to "do the right thing" in the arenas and domains over which they have had an influence.

Self-Efficacy

Self-efficacy is the belief about one's capability to learn or perform effectively at increased levels of complexity and challenge (Bandura, 1986). Effective self-regulation depends on feeling self-efficacious for using skills to achieve mastery (Bandura, 1986, 1993; Bouffard-Bouchard, Parent, & Larivee, 1991; Schunk 1996; Zimmerman, 1994). One's own performance offers reliable information when assessing self-efficacy. Successes raise efficacy and failures lower it (Zimmerman & Ringle, 1981). Students often create their own efficacy levels dependent on socially comparing their performance with others and peers offer a valid basis for comparison (Schunk 1987). At the Academy, we are committed to increasing students' academic performance by taking positive steps to increase self-efficacy.

Self-efficacy operates during all three phases of self-regulation. During the forethought phase they perceive if they can do the task at hand, they are thinking about the expected outcome and goals they may have. The performance phase consists of self-monitoring, use of strategy, motivation levels, and self-perception. The final phase of self-reflection is when individuals are reflecting and self-evaluating and making adaptations to their own behaviors (Schunk & Ertmer, 2000).

5. Development of a Plan for Formative and Summative Evaluation

Instrumentation

Connecticut Mastery Test (CMT). We will use the Connecticut Mastery Test to assess the academic growth of all students at the Academy. The CMT is the standard assessment administered to all students in the state of Connecticut. Students are assessed in the content areas of reading, mathematics, and writing (grades 3–8), as well as science (grades 5 and 8). Reports of individual student achievement relative to performance standards in each of these content areas are provided to the school districts and parents/guardians receive reports of each student tested.

BarOn EQ-i:YV. Self-Efficacy levels will be measured using the BarOn EQ-i:YV instrument, which is a self-reported psychometric instrument that is designed to measure the emotional and socially intelligent behavior in children and adolescents 7 to 18 years of age (Bar-On, 2007). This instrument consists of 60 items that are distributed across the 7 scales; Intrapersonal EQ, Interpersonal EQ, Stress Management EQ, Adaptability EQ, General Mood, Positive Impression, and Inconsistency Index. The Bar-On EQ-i has a reliability of .72 for males ($n=73$) and .80 for females ($n=279$) (Bar-On, 2004).

Motivated Strategies for Learning Questionnaire (MSLQ). Self-Regulation habits will be measured using the MSLQ, which has been normed in the United States. The Cronbach alpha is .86 for the MSLQ, the reliability values were greater than .70 indicating an acceptable statistic testing level (Nunnally, 1967). This 44 item questionnaire is a self-rating scale that examines factors such as motivation and learning strategies (Pintrich & DeGrott, 1990).

The Scale for Rating the Behavioral Characteristics of Superior Students (SRBCSS) (Renzulli et al., 2004). The SRBCSS will be an important instrument to help compare student growth over time in the areas of Learning, Motivation, Leadership, Creativity, Math, Reading, and Science. The SRBCSS is a questionnaire that is filled out by teachers. Having the input of teachers will help depict the daily influences and strategies students are utilizing for their educational advancement.

Personal Success Plan. Qualitative data will also be collected through the Personal Success Plan that students complete on RLS. The Personal Success Plan allows students to login and create goals, plans, and identify their heroes and helpers. Students then have activities with which they can digitally interact to engage within their interest areas. Lastly, students are able to select and complete a project within their own area(s) of interest. This online intervention can help to assess the growth of students who attend the Academy.

Surveys. The open-ended surveys will be self-reported information on study habits, extra curricular participation, goals for the future, and student reflections on participation in a program for academically high potential students. This instrument will help to gather information regarding the cognitive and metacognitive processes that are major goals of our instruction at the Academy (Pintrich, 2000).

Formative evaluation feedback will be gathered from students, teachers, administrators, and parents on a regular basis throughout the development of the replication schools. This information will be used to make in-process modifications deemed necessary by these major stakeholders.

Timeline

The following chart provides a timeline by year for the tasks necessary for the replication of the Renzulli Academy for high potential/low income students.

Tasks	Year 1 1/1/13 to 12/31/13	Year 2 1/1/14 to 12/31/14
Recruit school districts for replication sites. Arrange meetings with superintendents. Distribute descriptive information and application forms. Collect district demographic profiles. Seek Board of Education approval.	January 2013 through April 2013	
Make final decisions about four selected sites. Recruit and select replication site liaisons.	April 2013 through July 2013	
Recruit and select personnel who will serve as replication site trainers.	January 2013 through June 2013	Ongoing all year
Interview prospective teachers and administrators for positions at replication sites.	April 2013 through June 2013	
Provide initial teacher and administrator orientation.	June 2013	
Provide professional development for teachers and administrators.	Summer 2013 & Fall 2013	Ongoing all year
Invite teachers and administrators to attend Confratute for follow-up extensive professional development.	July 2013	July 2014
Identify gifted and high potential students at replication sites.	May 2013 through June 2013	May 2014 through June 2014
Schedule opening for Year 1 replication sites. Administer pre-assessments to students.	Fall 2013	Schedule opening for Year 2 replication sites. Administer pre-assessments to students
Schedule internships at Renzulli Academy and selected SEM Schools for teachers and administrators.	Fall 2013	
Administer post-assessments to students.	June 2014	June 2015*
Provide formative evaluation feedback.	Ongoing all year	Ongoing all year
Create website for all Renzulli Academies, DVD, and guidebooks for new and future replications.	Ongoing all year	Ongoing all year
Maintain academy replication website.	Ongoing all year	Ongoing all year
Analyze student data and provide interim reports.	Ongoing all year	Ongoing all year
Submit final written reports.		December 2014

* Final student data collection will occur at the end of the second academic year after the expiration of the grant on December 31, 2014. After the data is analyzed, results will be shared with the Jack Kent Cooke Foundation.

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