Closing Excellence and Opportunity Gaps for Students from Traditionally Underserved Populations in Gifted Education: A Multi-Tier Systems of Support Approach

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(a) PROJECT DESIGN OVERVIEW (30 points)

Our proposed project focuses on closing excellence and opportunity gaps for students from traditionally underserved populations in gifted education (i.e., students who are twice-exceptional, English learners, from ethnically diverse backgrounds, and from low-income backgrounds). We combined and built on principles from Multi-Tier Systems of Support (MTSS; Benner, Kutash, Nelson, & Fisher, 2013) and the Schoolwide Enrichment Model (SEM; Renzulli, 1977; Renzulli & Reis, 1985, 1997, 2014) to extend our current Achievement Motivation Enhancement model (AME; Desmet & Pereira, 2019) into a schoolwide, multi-tier approach to talent development, the AME+. The original AME model was an affective curriculum, that now has been extended to include three tiers of affective curriculum and support as well as STEM enrichment activities. This new, extended, AME+ model provides talent development opportunities for students with gifts and talents in Science, Technology, Engineering, or Mathematics (STEM). Specifically, the AME+ supports students from populations that have been traditionally underserved in gifted programs, by identifying their STEM learning potential and providing them with both the domain-specific skills and the socio-emotional skills needed to promote their talent development fully (Subotnik, Olszwelski-Kubilius, & Worell, 2011).

Following the core idea of MTSS and SEM, there will be three tiers of support and enrichment. Tier I will be open to all students and involves training teachers in relationship-focused teaching practices, positive behavior support (PBS), effective instruction, and universal screening of aptitude and learning potential in STEM domains. Based on data from the universal screening and with a particular focus on those from traditionally underserved populations, each semester a minimum of 40 students per school (a total of approximately 1,000 students across project schools over four years) will get access to Tier II support and enrichment. Tier II involves an affective curriculum focused on achievement motivation and

enrichment clusters. Of the students participating in Tier II, a minimum of 20 students per school will be selected to continue to Tier III support and enrichment (a total of 600 students across project schools over the years). Tier III involves personalized talent trajectories for each student, including achievement coaching and mentoring by industry professionals, with whom students will engage in real-world projects.

By providing all students with access to enrichment opportunities and enhanced educational experiences in the classroom in which teachers are trained to focus on socio-emotional needs and skills as well as domain-specific learning potential, the project will result in identifying significantly more students from traditionally underserved populations for talent development opportunities and in improving these students' achievement, motivation, engagement, self-regulation, self-efficacy, and wellbeing.

We will involve up to five schools in this scaled-up application of the AME model. We will follow a three-phase multiple baseline single-case design (Cf. What Works Clearinghouse Handbook) across those five schools. All schools will start Tier I at the same time which will coincide with our baseline phase. After one semester of Tier I enrichment and support, the first group of students at school one will enter Tier II (phase 2). After an additional 6 weeks of baseline, a group of students at school two will enter Tier II enrichment and support, 6 weeks after that a group of students at school three will leave baseline and enter Tier II, this will continue until all schools have moved into the second phase of our study. Tier II will last for six weeks. The third phase is then when students enter Tier III, following the same 6-week increments as described before. Tier III lasts six weeks as well. We will collect standardized measures of achievement, engagement, self-efficacy, motivation, and wellbeing, before Tier I, before Tier II and before and after Tier III. The order in which schools enter the second phase will be randomly determined. By using a multiple baseline, single-case design, we can decrease common threats to internal validity in single-case designs

(e.g., participant maturation, regression to the mean, and testing effects; Barlow, Nock, & Hersen, 2009)

Moreover, to allow for continuous improvement, we will evaluate results from school 1, immediately after they have completed Tier III (end of Year 2). Those data will be used to inform changes and updates to the AME+ model before implementing it again with a new set of students in each school (Year 3). The same three-phase, multiple baseline design will be used again, but now we will counterbalance the order in which the schools enter phase two. At the end of Year 3, we will again evaluate the results from those schools who have completed Tier III and use that to update the AME+ model before implementing an adjusted version in Year 4 and going through the same process of data collection one more time. In year 5, we will finalize data collection and provide resources and support for the schools to continue the implementation of the AME+ model with new students beyond the study. Table 1 provides an overview of the multiple baseline design for the first iteration to illustrate when each school will enter each Tier of the intervention. In years 3 and 4 a similar design will be used, but the order in which schools start Tier II will be changed.

Table 1. Overview of the multiple baseline research design for iteration 1

Weeks	School 1	School 2	School 3	School 4	School 5
1 - 6	Tier I	Tier I	Tier I	Tier I	Tier I
7 -12	Tier I	Tier I	Tier I	Tier I	Tier I
13 - 18	Tier II	Tier I	Tier I	Tier I	Tier I
19 - 24	Tier III	Tier II	Tier I	Tier I	Tier I
25 - 30		Tier III	Tier II	Tier I	Tier I
31 - 36			Tier III	Tier II	Tier I
37 - 42				Tier III	Tier II
43 - 48					Tier III

(1) Goals, Objectives, and Outcomes.

This project has clear and measurable goals based on previous and ongoing MTSS, SEM, and AME research.

GOAL 1: To implement and evaluate the effectiveness of the extended AME+ model in five schools that meet Javits Priority 3: Promoting effective instruction in classrooms and schools that are located in communities served by rural local educational agencies and high-poverty schools. *Objective 1a*: Select five schools that meet the Javits priority focusing on traditionally underserved populations, including rural and high-poverty schools. *Outcome 1a*: The sample contains schools with a significant number of students from traditionally underserved populations. We have support letters from three school districts with several school that meet Priority 3 and have at least one more district that expressed interest. *Objective 1b*: Build a continuum of support and enrichment (Tier I, Tier II, and Tier III) and develop teachers' ability to identify students' (especially those from traditionally underserved populations) needs and intervene appropriately. *Outcome 1b:* Track the implementation of the model and strategies involved at each Tier and continuously assess both students' and teachers' needs and their progress. *Objective 1c*: Evaluate the effectiveness of AME+ through a multilevel growth modeling approach. *Outcome 1c*: We find a statistically significant, positive effect of participating in the AME+ on achievement, engagement, motivation, self-efficacy, and interest in STEM. Specifically, the effectiveness of the model will be measured using multilevel growth modeling. See Outcome 4 for more details.

GOAL 2: To improve teacher knowledge, skills, and perceptions regarding socio-emotional needs and support for talent development for traditionally underserved students. *Objective 2a*: Teachers participate in ten online modules (see Appendix A for an overview of the modules). *Outcome 2a*: Participation will be tracked through online engagement (e.g., completion of units, reflection assignments). Following recommendations by Simonsen, Fairbanks, Briesch, Meyers, and Sugai (2008), we are aiming for 80% of teachers involved in the implementation of our model to complete the modules. *Objective 2b*:

Teachers have more accurate knowledge and perceptions of the socio-emotional needs of gifted students after participating. *Outcome 2b*: We find a statistically significant, positive difference between pre-test and post-test measures of teachers' perceptions and knowledge regarding socio-emotional needs and support for talent development for traditionally underserved students. *Objective 2c*: Teachers apply the principles of the relationship-focused teaching practices module and implement positive behavior interventions with all students. *Outcome 2*c: Through regular classroom observations (conducted by trained school coordinators), we see teachers accurately applying the strategies taught. Findings will be used to inform the training modules, which will be updated and adjusted yearly.

GOAL 3: To improve identification and access to opportunities for students from traditionally underserved populations. *Objective 3:* More students from underserved populations are identified for gifted and talented services. *Outcome 3*: Over time, the chances of students from traditionally underserved populations to be identified for gifted and talented services increase. Yearly odds ratios will be calculated to evaluate the improved identification of students from underserved populations compared to their peers. Identification for gifted and talented services includes both those students who participate in our Tier II and Tier III enrichment and support and those students who participate in other programming offered by the schools.

GOAL 4: To increase student achievement, engagement, motivation, wellbeing, and self-efficacy in STEM, particularly for those students from traditionally underserved students. *Objective 4:* Students demonstrate significant growth in achievement, engagement, motivation, wellbeing, and self-efficacy in STEM. *Outcome 4:* This will be measured using multilevel growth modeling to establish the degree to which the model has altered the normative developmental trajectory of achievement, engagement, motivation, wellbeing, self-regulation, and self-efficacy, that would have occurred without participating in

the model. Data for this will be collected all five years, before, during, and after participation in the different Tiers of the model. Quantitative and qualitative data will be used for ongoing evaluation of the AME+ model. Every year results from these evaluations will be used to inform changes to the services and training components of the model.

GOAL 5: To enable school personnel across the country to implement AME+ through effective dissemination of research, support materials, and professional development training modules. *Objective 5a:* Develop and distribute an effective model for training that will enable school staff to implement the AME+ model. *Outcome 5a:* The professional development training materials, as well as the enrichment and socio-emotional curricula, are made available nationally via conferences, workshops, and in an online repository in the project website. *Objective 5b:* Educators have easy access to information about the AME+ model and its research findings. *Outcome 5b:* Publications, presentations, and reports will be made readily available online.

(2) The Design of the Proposed Project.

Our proposed project, the AME+ model, is a schoolwide, multi-tier approach to talent development, created to provide talent development opportunities for students with gifts and talents in STEM domains (See Figure 1 for a visual representation of the AME+ model). Specifically, the AME+ supports traditionally underserved students by identifying their STEM learning potential and providing them with both the domain-specific skills and the socio-emotional skills needed to promote their talent development fully (Subotnik et al., 2011). The AME+ model includes three tiers of support and enrichment. Tier I, which is open to all students schoolwide, involves training teachers to improve relationship-focused teaching with a focus on improving student engagement in instruction, wellbeing, and self-efficacy (socio-emotional needs). Tier I enrichment includes providing initial schoolwide enrichment in different STEM domains, with an emphasis on computer science. Finally, Tier I

will conclude with universal screening of students' learning potential in STEM domains. This initial schoolwide phase allows us to use the identification methods, as well as the gifted and talented enrichment and support services with *all* students at the project schools, as we believe everyone will benefit from these.

After students engaged in the first tier of enrichment and support, students will have access to Tier II through three pathways: (a) Self-nominations using an adapted version of the *Interest-A-Lyzer* (Renzulli, 1997); (b) Teacher input through using a modified version of the *HOPE Teacher Rating Scale* (Gentry, Peters, Pereira, McIntosh, & Fugate, 2015) which will include questions to probe teachers to reflect on students learning potential in the STEM domains using principles of dynamic assessment; and (c) Student achievement and growth during Tier I enrichment. The latter will only be considered as a secondary factor, used for inclusion only; the emphasis will be on those who showed great learning potential, growth, and interest.

Tier II will be open to 1,000 students (40 per semester, per school), with a particular focus on those from traditionally underserved populations. Project schools can include additional students if they have the resources, such as teachers to work with additional students and to purchase materials. We will provide support and the curriculum for schools with the resources to provide enrichment opportunities for additional students. Tier II support will involve training teachers to implement the Achievement Motivation Enhancement model (AME; Desmet & Pereira, 2019), which are small group discussions to support talent development and socio-emotional needs (See Appendix B for an overview of the topics). Tier II enrichment involves enrichment clusters, which will utilize existing enrichment curricula such as the ones we have previously created and used in the Gifted Education Research and Resource Institute (GER^2I) talent development programs: Fun with Programming (computer science), Robotech: Bytes & Bots (robotics and computer science), STEAM Labs

(engineering design, robotics/programming, mechanical engineering), the Internet of Things (programming, electrical and mechanical engineering). These curriculum units have been well researched and shown to be effective (Jordan & Pereira, 2009; Jordan, Pereira, Dalrymple, 2016; Qian & Lehman, 2016; Zhou et al., 2017). After students engaged in Tier II enrichment and support, we will use adaptations of the *Secondary Interest-A-Lyzer* (Hébert, Sorensen, & Renzulli, 2014) and *The Intake Interview Checklist for Type III Investigations* (Burns, 2014) to help determine which students interest best fit our Tier III enrichment and support offering.

Tier III will be open to 600 students over the course of the project (20 per semester, per school). These students will receive personalized talent development through a one-on-one or small group (at most 5 students per group) achievement coaching. Students will be matched with a mentor, with whom they will work on real-world, problem-based projects and receive advanced support in reaching their STEM-related career goals. Mentors will be STEM professionals or advanced graduate students with experience in industry. We will make every effort to select a diverse group of mentors that represent the same diversity as our target student population.

By providing all students with access to enrichment opportunities and enhanced educational experiences in the classroom in which teachers are trained to focus on socio-emotional needs and skills as well as domain-specific skills and learning potential, the project will result in identifying significantly more students from traditionally underserved populations for talent development opportunities and in improving these students' achievement, motivation, engagement, self-regulation, self-efficacy, and wellbeing.

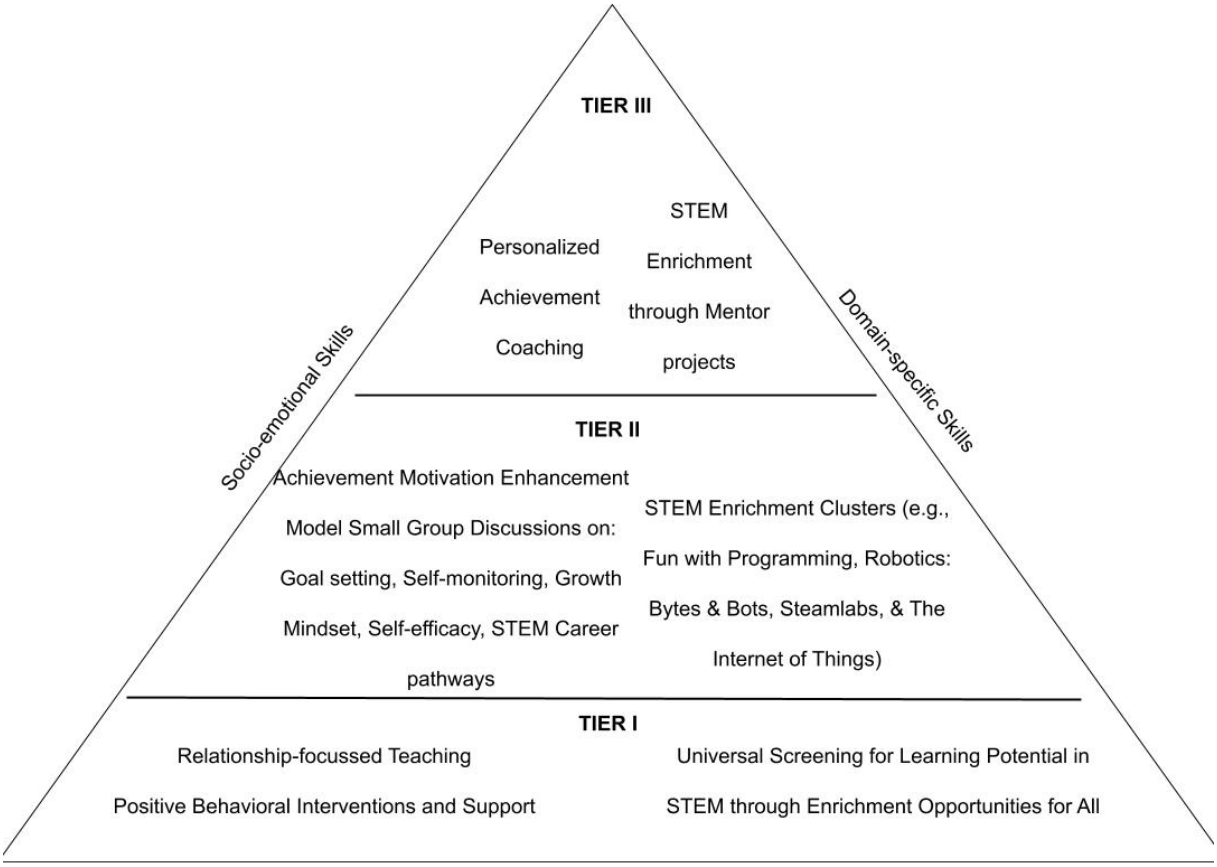

Figure 1 The AME+ Model

AME+ addresses Javits Priority 1, to develop new information that assists schools in the identification of, and provision of services to gifted and talented students (including economically disadvantaged individuals, individuals who are English learners, and children with disabilities) by providing enrichment opportunities for all students and training teachers in relationship-focused strategies that improve students engagement, wellbeing, and self-efficacy as well as training teachers to look at learning potential and not just achievement. AME+ also addresses Javits priority 2, improving student achievement or other educational outcomes in computer science by focusing our domain-specific enrichment in STEM and computer science specifically. We are targeting both academic and socio-emotional outcomes. Finally, AME+ addresses Priority 3, promoting innovative strategies to increase the number of students who have access to effective educators in rural and high-poverty schools by ensuring that the schools we collaborate with fall into those categories.

(3) Exceptional Approach for meeting statutory purposes.

AME+ represents an exceptional approach for serving gifted students in their STEM talent development, as it provides access to enrichment opportunities and socio-emotional support for all students in the project schools, which results in more students from traditionally underserved populations to be identified and served as gifted and talented. Research has shown that one of the main issues preventing students from these populations from being identified and receiving gifted education services is limited access. By providing opportunities for enrichment in their schools, our goal is to provide an environment where they can demonstrate their abilities in their areas of interest and talent.

The combination of investing in socio-emotional support and skills as well as in domain-specific skills creates the conditions necessary for students to find their interest areas and for talent to emerge. Our multiple baseline design will allow us to examine the effectiveness of our model and further provide validity evidence for the model with a particular emphasis on students from traditionally underserved populations.

As part of the project, we will develop professional development materials, most of which will be provided online to support school staff as they implement the AME+ model. These materials and online modules will be evaluated and updated, and after completion of the project, they will be disseminated widely and made available to educators across the country to provide support for their implementation of the AME+ model. Our goal is to provide other schools not participating in this project, especially those with limited funding for professional development with quality training materials, thus extending the reach and impact of this project well beyond its five years.

In summary, this project addresses all priorities of the Javits 2019 program and the AME+ model has the potential to provide educators with the tools they need to effectively

identify and meet the needs of gifted students from traditionally underrepresented populations and improve *all* students' achievement, engagement, wellbeing, motivation, and self-efficacy and relationship-focused teaching practices.

(4) Promising Evidence Supporting the Proposed Project.

Our proposed project builds on three existing models, the Multi-Tier System of Support (MTSS) framework, the Schoolwide Enrichment Model (SEM), and the Achievement Enhancement model (AME).

Multi-Tier System of Supports. The *Every Student Succeeds Act* (ESSA) defines a Multi-Tier System of Supports as "a comprehensive continuum of evidence-based, systemic practices to support a rapid response to students' needs" (ESSA, 2015, p. 394). Following this framework, we have created the AME+ model as a continuum of enrichment and support, with services for students at three different tiers. Research has shown that by merging the academic and behavioral domains through multi-tiered interventions, schools are better able to deliver more equitable access to supports (Lane, Menzies, Ennis, & Bezdek, 2013). Furthermore, combining principles of MTSS with SEM has been suggested as a potentially successful approach to better serve students with gifts and talents from a variety of backgrounds, including those from rural areas, those who are twice-exceptional, and those from culturally and linguistically diverse backgrounds (Coleman & Johnson, 2011). Core principles used within MTSS frameworks include progress monitoring, effective instruction, and universal screening (McIntosh & Goodman, 2016). Universal screening has been shown to improve identification of traditionally underserved groups (Card & Giuliano, 2015; Lakin, 2016). More specifically, as mentioned above, our universal screening will focus on identifying learning potential. Therefore, we will use principles of dynamic testing and focus on the progress students make during Tier I enrichment and support (i.e., progress monitoring). Lidz and Macrin (2001) found that using dynamic testing increased the

identification of culturally and linguistically diverse students for gifted programming from <1% to 5%.

Similarly, Vantassel-Baska, Johnson, and Avery (2002) were able to identify 11.6% African American students, 14.9% students who were eligible for free and reduced lunch, and 5% students from other minority groups for gifted programming by using dynamic assessment tools, and the practice has been recommended when identifying twice-exceptional students (Neihart, 2008) as well. The MTSS key component of effective instruction is an essential part of the SEM and therefore of the AME+ model as well. The AME+ model uses the evidence-based practices created within the SEM for effective instruction, and we have added socio-emotional support drawing from evidence-based practices at each Tier as well.

The Schoolwide Enrichment Model (SEM). The SEM is essentially an integrated continuum of enrichment services to stimulate high-end learning and develop talents in all students. High-end learning consists of applying relevant knowledge, research skills, creative and critical thinking, and interpersonal skills to the solution of real problems (Renzulli, Gentry, & Reis, 2014). Over the last three decades, researchers have provided evidence that SEM and its related services are effective at increasing engagement, achievement, and self-concept in variety of contexts and with diverse student populations (for an overview see Reis & Renzulli, 2010). For example, Beecher and Sweeney (2008) found that implementing SEM significantly reduced income-based and race/ethnicity-based achievement gaps. The income-based achievement gap reduced from 62% difference in state achievement scores to 10% between 1997 and 2004. All ethnic groups made significant progress as well: Asian students scored 60% higher on state exams between 1997 and 2004 which led these students to outperform White students by approximately 15% in 2004; Black students increased their achievement by 20% which lowered the Black-White achievement gap to approximately 3% in 2004 compared to 17% in 1997; and Hispanic and White students increased their

achievement by approximately 5% on the state achievement exams. Following a randomized experimental study Field (2009) found statistically significant, small effects of Renzulli Learning (a component of SEM) on students' attitudes toward school ($\eta^2 = .06$), social studies achievement ($\eta^2 = .02$), science achievement ($\eta^2 = .01$), and reading comprehension ($\eta 2 = .05$). SEM has also proven effective for twice-exceptional (2E) populations. Olenchak (1995) found a .3 standard deviation increase in 2E students' self-concept after participating in a curriculum that was personally tailored to students' strengths and interests (i.e., Tier III enrichment). Furthermore, researchers have provided evidence in favor of using SEM in urban schools serving culturally diverse students and high-poverty schools (e.g., Reis & Renzulli, 2003; Renzulli & Reis, 1994). Reis, McCoach, Little, Muller, and Kaniskan (2011) used an experimental design to evaluate SEM-Reading and found evidence in favor of SEM. Specifically, they found significant differences in reading fluency in an urban (Cohen's *d* = .33) and a suburban school (Cohen's *d* = .10) and in reading comprehension in a high-poverty urban school (Cohen's *d* = .27). In conclusion, the use of enrichment practices related to students' interests and strengths has proven to increase engagement in learning and achievement for all students (e.g., Field, 2009; Reis, Eckert, McCoach, Jacobs, & Coyne, 2008; Reis & Fogarty, 2006; Reis & Housand, 2009; Siegle & McCoach, 2005).

The extended Achievement Motivation Enhancement (AME+) model continuum of support. For schoolwide support at Tier I, we opted to focus on increasing the quality of the student-teacher relationships through positive interactions. Students spend a significant amount of time in classrooms with teachers. It is therefore not surprising that the relationship between students and teachers plays a central role in students' educational outcomes (Brinkworth, McIntyre, Juraschek, & Gehlbach, 2018) and their socio-emotional development (Verscheuren & Koomen, 2012). Based on a meta-analysis of 119 studies on student-teacher relationships, Cornelius-White (2007) concluded that the mean correlation between student-

teacher relationships and positive student outcomes (e.g., motivation, self-esteem, achievement, and behavior) was .36 (p.120). Similarly, Roorda et al. (2011) found small to medium effects of positive student-teacher relationships on positive engagement, r = .34, and achievement, r = .16, as well as for the effects of negative relationships on negative engagement, r = -.32, and achievement, r = -.15 based on their meta-analysis of 99 studies on student-teacher relationships. Researchers have also found that a students' socio-economic background is negatively related to the student-teacher relationship quality (O'Connor & McCartney, 2006; Wyrick & Rudasil, 2009). For example, Wyrick and Rudasil (2009) found that those students from families with lower incomes had less close relationships with teachers than their peers from wealthier families. These findings support the importance of student-teacher relationship quality for student achievement and student engagement and thus support the importance of relationship-focused interventions. Klem and Connell (2009) implemented a schoolwide initiative focused on creating more personalized educational environments (i.e., improving affective student-teacher relationships and support among other things) and found that this led to increased attendance, persistence, achievement and graduation rates across elementary, middle, and high school students.

As part of the extended, schoolwide, multi-tier AME+, the original AME affective curriculum used in small-group discussions will be used as a Tier II support intervention. Following the Peterson Proactive Developmental Attention framework (Peterson & Jen, 2018), the AME was created as an affective curriculum to help increase achievement and achievement motivation in students. Specifically, the affective curriculum was designed to fit the themes identified in a multiple narrative study of underachieving students (Desmet, Pereira, & Peterson, 2019) as well as the Achievement-Orientation Model (Siegle, McCoach, & Roberts, 2017). The AME includes exercises and small group discussions on topics such as enhancing achievement motivation and self-efficacy, stimulating metacognitive and self-

regulation skills, effective learning, and goal setting. We are currently in the process of evaluating the effectiveness of the AME (Desmet & Pereira, 2019). However, previous research such as that on the GERI-Purdue Affective model (Jen, Gentry, & Moon, 2017), which uses a similar small group discussion format and has been implemented since 2012 at a university-based enrichment program for gifted, creative, and talented students, has shown positive results. Jen et al. (2017) found that the group experience was perceived positively by all parties involved – including students and group facilitators from culturally and linguistically diverse backgrounds. Moreover, Jen et al. specifically explored the experiences of Native American students and reported that 22 out of 24 Native American (Diné, Ojibwe, and Lakota tribes) students mentioned positively altering their behaviors after participating in the small group discussions. Finally, a large body of research supports the use of socio-emotional interventions in schools because students' academic achievement is mediated by socio-emotional outcomes such as persistence, motivation, self-efficacy, self-regulation, perceived support, engagement, and overall wellbeing (e.g., Durlak, Weissberg, Dymnikci, Taylor, & Schellinger, 2011; Siegle et al., 2017).

Results from a meta-analysis of more than 200 interventions designed to increase students' socio-emotional skills showed that, on average, students who participated in these interventions had higher academic achievement than those who did not participate (average EF = .69; Durlak et al., 2011). In Durlak et al.'s (2011) meta-analysis they defined quality socio-emotional interventions as programming which provides students with opportunities to contribute to their class, school, and community, programming which fosters sense of belonging, enhanced motivation, improved classroom management, and teaching practices, which are all elements of the AME+ model at each Tier, with contribution to community being fostered at Tier III specifically. AME+ Tier III support will include individualized achievement coaching through a mentoring program in which students will not only be

engaging in achievement coaching; they will also be participating in real-world problem-solving projects with their mentors. Hébert and Olenchak (2000) found that the open-minded, nonjudgmental character of the mentor, together with the personalized socio-emotional support, advocacy, and strength and interest-based interventions make mentorship a valuable tool for increasing academic achievement and motivation. It has been suggested that mentors, preferably ones that share gender and race/ethnic identities with students, have positive impacts on achievement, motivation, and identification of students, especially students from traditionally underserved populations (e.g., Grantham, 2004; Olszewski-Kubilius & Clarenbach, 2014; Whiting, 2009). Finally, large amounts of research support the use of real-world application and project-based learning, for example research has shown that project-based learning in STEM can increase students' achievement, engagement, and future pursuit of STEM careers (e.g., Han, Capraro, & Capraro, 2015; Tseng, Chang, Lou, & Chen, 2013).

(5) Performance Feedback and Continuous Improvement as integral parts of the design. As students complete the different enrichment and support opportunities available to them in the different Tiers, they will be asked to participate in reflection assignments, surveys, and interviews to help us continually evaluate and improve our design (See Appendix C for more information on instruments and surveys used). Similarly, we will continuously survey and interview teachers, coordinators, and other staff involved in implementing different aspects of our model and use this information to improve the model yearly. By allowing a new group of students to engage in the three Tiers of enrichment and support each year during years 2 to 4, we have the opportunity to evaluate the changes we make to the model. Moreover, some of the tools used for program evaluation purposes will be made available as an integral part of the model, allowing a school to evaluate their progress and implementation of the model.

(b) PROJECT PERSONNEL (25 points)

The project team consists of experienced researchers with expertise in gifted and talented education, research and program evaluation, STEM education and talent development, enrichment programming, strategies that work with underserved populations (including expertise in the specific populations that are the focus of this project), and in-depth knowledge of the MTSS framework, and the SEM and AME models. The team members also have extensive experience with large-scale, longitudinal research projects involving schools and are thus uniquely qualified to accomplish the project goals.

(1) Qualifications, relevant training, and experience of project director

***Nielsen Pereira*, *Ph.D.* (gifted education, underserved populations, STEM).** Assistant Professor of Gifted, Creative, and Talented Studies at Purdue University. His research interests include conceptual, contextual, and measurement issues in the identification of gifted and talented populations; design and assessment of learning in varied gifted and talented education contexts; and understanding gifted and talented student experiences in talent development programs in and out of school. He is Associate Editor for Gifted and Talented International and an editorial board member for the Journal of Advanced Academics, the Journal for the Education of the Gifted, and Gifted Child Quarterly. He served as Program Chair for National Association for Gifted Children's (NAGC) Special Populations Network and chaired the Research Into Practice Committee within NAGC's Research and Evaluation Network. He co-developed the curriculum for the STEAM Labs program (http://steamlabs.education), which challenges middle and high-school students to learn and apply the engineering design process in a cooperative learning environment. He taught English as a second language for 12 years in public schools and language institutes in Brazil before moving to the United States to pursue his doctorate in gifted, creative, and talented studies at Purdue University. He is a regular presenter in national and international

conferences on educational research, gifted education and talent development, and STEM education. Dr. Pereira has experience in qualitative and quantitative methods, which he has applied in a variety of research projects, which have been funded by the Jack Kent Cooke Foundation, the Javits Gifted and Talented Students Education Program, and the American Psychological Foundation. He is the evaluator for the Javits-funded project titled "Developing Talents and Improving Student Achievement and Identification as Gifted Among Traditionally Underrepresented Populations: An Experimental Investigation Scaling up the Total School Cluster Grouping Model. He has engaged in research related to the goals in this project, which will be an extension of some of his recent work, including: using of the *HOPE Teacher Rating Scale* (Gentry et al., 2015) to identify English language learners (Pereira, 2011), the development of the AME model (Desmet, Pereira, & Peterson, 2019; Desmet & Pereira, 2019), designing STEM enrichment programming (Jordan, Pereira, & Dalrymple, 2016; Zhou et al., 2017); students' perceptions of enrichment and in-school programs (Pereira, Bakhiet, Gentry, Balhmar, & Hakami, 2017; Pereira, Peters, & Gentry, 2010); and evaluating in-school interventions (Pereira, Tay, Maeda, & Gentry, 2019).

(2) Qualifications, relevant training, and experiences of the key project personnel

Co-PI. *Ronald Martella, Ph.D., BCBA-D* (MTSS, PBS, single-case designs, special education). Professor of Educational Studies within the special education program at Purdue University, teaching classes in applied behavior analysis. He has over 30 years of experience working with at-risk populations. Dr. Martella has approximately 160 professional publications. He is the lead author of a comprehensive behavior management textbook with Sage Publishing and a research methods textbook with Guilford Publishing, and consults with school districts on behavior management issues. Further, Dr. Martella has conducted over 250 professional presentations. Dr. Martella has worked on and led several state and federal grants and large-scale curriculum development projects (including *Read to Achieve* and *SRA FLEX*

Literacy published by McGraw-Hill). He has written about, conducted research on, and provided workshops on School-Wide Positive Behavior Supports (SWPBS) and Multi-Tier Systems of Supports (MTSS).

Co-PI 2. Hua Hua Chang, *Ph.D.* (research methods and evaluation). The Charles R. Hicks Chair Professor in the Department of Educational Studies at Purdue University. Dr. Chang is a practitioner turned professor. After earning his Ph.D. in statistics from UIUC in 1992, he joined the testing industry and worked there for nine years before moving to academia in 2001. From 1992 to 1999, he worked as a research scientist at Educational Testing Service where he directed statistical analyses of several large-scale projects for the National Assessment of Educational Process (NAEP), also known as The Nation's Report Card, that is the only assessment that measures what U.S. students know and can do in various subjects. From 1999 to 2001, Dr. Chang served as Senior Psychometrician and Director of Computerized Testing Research at National Board of Medical Examiners (NBME), Philadelphia, PA, where he worked extensively on various research projects for the United States Medical Licensing Examination (USMLE). The USMLE assesses a physician's ability and skills that are essential to providing safe and effective patient care. Dr. Chang has served as PI and co-PI on numerous research grants, including NSF, IES and Illinois State Board of Education. His interests are broad, encompassing both theoretical development and applied methodologies in educational statistics and psychometrics. Most recently, his work has been concentrated on developing web-based assessment tools to facilitate individualized learning. Dr. Chang is a fellow of the American Educational Research Association (AERA), past president of the Psychometric Society and the recipient of the 2017 AERA's E. F. Lindquist Award. Most recently, he was selected as a fellow of the American Statistical Association.

Key Person 1. ***Ophélie Desmet, M.S.*** (talent development, AME, gifted education). Doctoral Candidate at Purdue University, focusing her work on talent development, underachievement, achievement motivation, and underserved youth. She developed the AME model and received two grants to support this work (with Pereira), one from the American Psychological Foundation ($46,730) and another from the National Association for Gifted Children ($2,500). She has published three peer-reviewed manuscripts, has six manuscripts under review, and co-authored two books on academic underachievement. She is the founder and Co-Chair of the Underachievement Resource Institute (Belgium) and has made 32 presentations at a variety of international, national, and local conferences. Her work has been recognized with several competitive awards including one from the American Educational Research Association and one from the National Association for Gifted Children.

Key Person 2. ***Marcia Gentry, Ph.D.*** (SEM, program development, instrument design, underserved populations, gifted education). Professor of Gifted Education, Director of the Gifted Education Research and Resource Institute and doctoral programs in gifted education at Purdue University. She originated and studied Projects HOPE and HOPE+, providing access to Purdue's gifted programming to students from low-income families and to Native American students (Diné, Lakota, Ojibwe) from low-income families, respectively and the Total School Cluster Grouping (TSCG) Model, currently funded as a scale-up study by Javits. During the past 10 years, she has worked with more than 150 school districts as they developed, implemented, and evaluated gifted programming, identification and strategies. Previously a K-12 teacher and administrator, she has received several million dollars in extramural funding, authored more than 70 journal articles, 20 chapters, 2 books, and 8 instruments, including the HOPE Scale, which was designed to help teachers recognize talent among traditionally underserved students."

Key Person 3. ***Jean Peterson, Ph.D.*** (socio-emotional needs). Professor emerita and former director of school-counselor preparation at Purdue was a long-time classroom teacher before her doctorate in Counselor Education. A licensed mental health counselor with considerable clinical experience with gifted youth and their families, she continues to present at conferences and schools about the social and emotional development of gifted students. She has authored more than 100 books and refereed or invited articles and chapters and served two terms on the NAGC Board of Directors.

(c) QUALITY OF THE MANAGEMENT PLAN (15 points)

(1) Management Plan, Including Clearly Defined Responsibilities, timelines, and milestones.

We propose a five-year implementation and evaluation of the AME+ model. Year 1 will serve as a start-up phase in which we work with partner schools to recruit coordinators and teacher, train personnel in the participating schools, help faculty and staff understand the model, begin involving teachers in the online training modules to prepare them for implementation in Year 2, and develop instruments and surveys. During Year 2, we will be implementing the intervention for the first time. We will collect achievement, engagement, self-regulation, and self-efficacy data from students as well as data on teachers' perceptions and needs (See Appendix C for details). As stated above, we plan on evaluating and updating the model accordingly at three different times, at the end of Years 2, 3, and 4, respectively. The previously mentioned data will be used to support this continued evaluation and to inform what adjustments need to be made to the model each time it will be re-implemented.

Project Principal Investigator Nielsen Pereira will coordinate all project activities and work with the project team to achieve all project objectives within the project period. Dr. Pereira will also manage the project budget. He will also submit annual reports with information on completion of goals to the Javits program officer and coordinate the dissemination of results with the project team. Table 2 displays the timeline of project activities as they relate to the project objectives, as well as the team member(s) who will be primarily responsible for each task.

Table 2. Project Goals, Activities, Responsible Personnel, and Timeline

Obj.	**Activity, (primary person(s) responsible*)***	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**
	Coordinate team, implementation, communication (Pereira)	■	■	■	■	■
1A	Identify schools and contact persons (Pereira)	■				
	Identify project coordinators per school (Pereira)	■				
1B	Schedule regional, on-site professional development training (Pereira)	■	■	■	■	
	Conduct professional development training (Pereira, Peterson, & Desmet)	■	■	■	■	
1C	Develop evaluation questionnaires (Chang and Pereira)	■				
	Administer questionnaires (Pereira)	■	■	■	■	■
	Evaluate data from questionnaires (Chang & Desmet)	■	■	■	■	■
2A	Develop online professional development modules (Pereira, Martella, Desmet, Gentry, & Peterson)	■				
	Oversee online module implementation (Pereira)	■	■	■	■	■
	Develop evaluation questionnaires (Chang)	■				
	Collect questionnaires (Desmet)		■	■	■	

Obj.	Activity, (primary person(s) responsible*)*	Y1	Y2	Y3	Y4	Y5
	Evaluate data from questionnaires (Chang & Desmet)					
	Maintain record of online engagement (Desmet)					
	Provide content revisions for modules (Pereira, Martella, Desmet, Gentry, & Peterson)					
2B	Develop measures of teacher perceptions (Chang & Desmet)					
	Evaluate data on teacher preceptions (Chang & Desmet)					
	Develop observation protocol (Martella)					
2C	Train school coordinators on data collection (Martella)					
	Oversee observation data collection (Martella)					
	Evaluate data form observations (Martella)					
	Provide revisions for professional development training, modules, and support (Pereira, Martella, Desmet, Gentry & Peterson)					
3	Engage schools in identification of learning potential (Pereira)					
	Collect identification data (Pereira)					
4	Collect data on student achievement, engagement, motivation, well-being, and self-efficacy in STEM (Pereira)					
	Analyze achievement, engagement, motivation, well-being, and self-efficacy in STEM data through multivel growth modeling (Chang)					
	Conduct student and teacher interviews (Pereira, & Desmet)					
	Analyze interview data (Desmet)					

Obj.	Activity, (primary person(s) responsible*)*	Y1	Y2	Y3	Y4	Y5
5A	Track online professional development engagement (Pereira & Desmet)					
	Evaluate levels and quality of engagement (Pereira & Desmet)					
5B	Prepare conference presentations (Pereira, Martella, Chang, Desmet, Gentry, & Peterson)					
	Oversee preparation of web-based dessimination of the model (Pereira)					
	Dissemination of online professional development modules (Pereira, Martella, Chang, Desmet, Gentry, & Peterson)					
	Dissemination of online enrichment modules (Pereira, Martella, Chang, Desmet, & Peterson)					
	Dissemination of research findings (Pereira, Martella, Chang, Desmet, Gentry, & Peterson)					
	Interim and final reports (each, yearly) (Pereira)					

(2) Procedures for Ensuring Feedback and Continuous Improvement.

As described in the "Performance Feedback and Continuous Improvement as integral parts of the design" section above, we have built a feedback loop into the model, which will allow us to continuously evaluate and improve the AME+ model and its implementation. The instruments used for evaluation will also serve as tools to support and encourage self-evaluation as project schools start to implement the model with our support. Specifically, we will evaluate and update the model at three different times, at the end of years two, three, and four.

Moreover, a strategically selected advisory board (see Table 2) supporting this research will provide critical feedback on research methods, curriculum development, and student programming. Advisory board members will meet at least once a year by web conference or phone, in addition to providing guidance on an as-needed basis throughout the year. Each advisory board member will submit a written evaluation after each annual meeting, and a summative evaluation at the end of the 5-year project. Letters of commitment from advisory board members are attached as supplemental documents. Advisory board members will monitor development of project deliverables, including Institutional Review Board application and approval, development of enrichment activities focusing on STEM and computer science, review project meeting notes, track and analyze participant demographics to ensure effective recruitment and retention of target populations. The PI will participate in advisory board meetings to provide information on project progress. Finally, advisory board members will monitor research dissemination produced.

Table 3. Advisory board members

Member	**Affiliation**	**Specific Experience Relevant to Project**
C. Matt Fugate, Ph.D.	Professor of Educational Psychology, University of Houston - Downtown	Gifted, creative, and talented educations, twice-exceptional students
Scott Peters, Ph.D.	Professor of Educational Foundations, University of Wisconsin - Whitewater	Gifted, creative, and talented education, out-of-school talent development programs, achievement gaps and unserved populations
Luciana de Oliveira, Ph.D.	Professor of Teaching and Learning, University of Miami	English language learners, qualitative research methods
Pedro Fonseca, Ph.D.	Assistant Professor of Computer Science, Purdue University	Computer science

(d) **PROJECT SERVICES (30 points)**

Students from low-income backgrounds, and from racial, ethnic, or cultural groups that have been historically disadvantaged, tend to underperform academically (Rutowski, Rutowski, & Plucker, 2012). These differences in achievement between students from these vulnerable groups and other students are called achievement gaps, and achievement gaps among subgroups of students who perform at advanced levels of achievement are called

excellence gaps (Burroughs & Plucker, 2014; Hardesty, McWilliams, & Plucker, 2014; Plucker & Peters, 2016). Given that Black and Hispanic students are some of the fastest growing subgroups in K-12 in the U.S., failing to nurture the talents of top students in vulnerable groups is not only a missed opportunity but could have severe consequences for the U.S. economy in the long run. Research indicates that often, Black and Hispanic students are not provided with the resources needed to reach their full educational potential (McMurrer & Kober, 2011; Plucker, Hardesty, & Burrows, 2013). Further, these excellence gaps are getting larger over time (McMurrer & Kober, 2011; Plucker et al., 2013). For example, using the National Assessment of Educational Progress (NAEP) data, Plucker et al. (2013) found that the percentage of White students scoring at advanced levels increased by 5.9 percentage points from 1996 to 2011, while the percentages of Black and Hispanic students only increased by 1.4 and 1.9 percentage points, respectively. Wu (2015) found that the percentage of Native American students scoring at advanced levels increased by 1.1% during that same period.

To date, most of the research on excellence gaps has been descriptive, however, to close these gaps and help *all* students reach their full potential, we need to make advanced achievement and talent development a priority. There is a clear need for research on interventions aimed at closing and preventing excellence gaps. Therefore, we propose to implement and evaluate an extended version of the Achievement Motivation Enhancement model (AME; Desmet & Pereira, 2019), the schoolwide, multi-tier AME+ model.

(1) Equal access. We aim to close opportunity gaps by providing enrichment and support via two pathways. First, we will target schools with large populations of traditionally underserved populations. Second, we will provide schoolwide enrichment and support to *all* students before conducting a universal screening centered on identifying learning potential.

Moreover, as students are selected to participate in Tiers II and III enrichment and support, priority will be given to those from traditionally unserved populations. First, we will allow for self-nominations, a commonly recommended practice for improving equitable access to gifted education (Payne, 2011). Second, teachers will be asked to nominate students using an adapted version of the *HOPE Teacher Rating Scale* (Gentry et al., 2015), an instrument specifically created and validated for use with students from low-income and ethnically diverse backgrounds and centered on principles of local norming (Peters & Gentry, 2010). Adaptations to the HOPE Teacher Rating Scale will include training teachers to use principles of dynamic assessment of learning potential and progress in their classroom practice to assess talent in the STEM domains. Adding a focus on student growth and learning potential can potentially allow us to identify more 2E (Crepeau-Hobson & Bianco, 2011; Yssel, Adams, Clarke, & Jones, 2014) and English Learners (Bianco & Harris, 2014; Ford & Trotman-Scott, 2013). Third, student achievement in STEM domains will only be used for inclusion purposes. Finally, research has shown that for enrichment programming, the "or" rule for multiple criteria is the most reasonable choice (McBee, Peters, & Waterman, 2014). Therefore, students will not need to meet all three criteria to be considered for our Tier II enrichment and support.

(2) Impact. Given the extensive body of empirical research the AME+ model builds upon, we hypothesize two major changes from implementing the AME+ model: (1) An increase in the amount of traditionally underserved students who are identified for gifted services, and (2) an increase in academic achievement, motivation, engagement, self-regulation, self-efficacy, and wellbeing among *all* students which will increase the amount of traditionally underserved students pursuing careers in STEM.

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Appendix A: Overview of the Profession Development Modules

Each module will be designed to take approximately 30 minutes to complete and will be made available through an online platform that allows for interaction with the instructors as necessary through discussion boards.

Module	Description	Personnel
1. Developing Talents in Underserved Populations	In this module, you will learn about the unique needs of gifted and talented students from traditionally underserved populations. Specifically, we will address characteristics, needs, and services for culturally and linguistically diverse students and English Learners.	Pereira Gentry
2. Twice-Exceptional Students	In this module, you will learn about students who are both gifted and have one or more developmental or learning disability. We will provide you with information on the needs and characteristics of these students, as well as how to best serve them.	Martella Desmet
3. Socio-Emotional characteristics and needs students with gifts and talents	In this module, you will explore the social and emotional development of gifted youth from a counselor's perspective. You gain insights about the effect of giftedness on how developmental challenges are experienced, about developmental aspects of high achievement and	Peterson

	underachievement, and about vulnerability and resilience.	
4. AME+: A schoolwide, multi-tier approach to talent development	In this module, we will introduce you to the model and the research behind it.	Pereira Desmet
5. Tier I Support: Relationship-Focused Teaching and Positive Behavioral and Support (PBS).	In this module, you will learn how to establish and maintain positive student-teacher relationships with all students. This module offers insights and small in-classroom interventions to help you increase the engagement and wellbeing of all students through principles of PBS and relationship focused teaching.	Martella
6. Tier I Support: Identification	In this module, you will learn the ins and outs of the HOPE Teacher Rating Scale and what dynamic assessment looks like during Tier I universal screening activities.	Pereira Gentry Chang
7. Tier I enrichment: curriculum	In this module, you will find all the information you need to implement the Tier I enrichment curriculum along with tips and tricks on effective instruction. Specifically, we will address principles of direct instruction and how to integrate direct instruction with project-based learning in an enrichment context.	Pereira Desmet

8. Tier II Support: Achievement Motivation Enhancement Model	In this module, you we will go over the curriculum that is being used in the Tier II support. Explore the empirical evidence behind and learn tips and tricks to effectively guide small group discussions to increase achievement motivation in all students.	Desmet
9. Tier II Enrichment: enrichment cluster curriculum	In this module, you will find all the information you need to implement the Tier I enrichment curriculum along with tips and tools for effective instruction. Specifically, we will address principles of project-based learning and how to use just-in-time instruction and scaffolding to become a learning guide for students.	Pereira Desmet
10. Tier III Support & Enrichment: Achievement Coaching and Mentoring	In this module, we will provide an in-depth overview of how to establish a good mentoring relationship with students and how to support and encourage talent development. You will learn everything you need to know to implement the Tier III support and enrichment.	Desmet Peterson

Appendix B: The Achievement Enhancement Model Small Group Discussion Topics

At Tier II, students will engage in 6 small group discussion sessions on the following topics:

1. Hello, my name is …

   The first session will serve as an extensive "getting-to-know-you" activity in which students will get to know each other and will reflect on why they are here. Specifically, students will engage in reflection activities to discover their interests and aspirations in STEM.

2. Goal Setting

   Students will learn how to formulate goals and break it down into small, manageable steps. They will reflect on where they are currently at in terms of achieving that goal and what steps still need to be taken. Students will discuss strategies for achieving those goals.

3. Self-Monitoring

   Students will learn and practice different ways of monitoring their own progress, planning for success, and evaluating personal progress.

4. Dealing with setbacks

   Students will discuss their personal strengths. They will reflect on potential challenges they foresee when working towards their goals and how to deal with those challenges, keeping in mind their own strengths. Students will practice with strategies for dealing with setbacks and how to motivate themselves.

5. Developing resilience

   Building on the previous session students will continue to reflect on their personal strengths, talents, foreseeable pitfalls, and areas to improve. Through guided discussion students will learn to maintain a growth mindset and to focus on process and progress they are making.

6. Career pathways

   The final session will allow for reflection on all previous topics and will include discussion regarding different STEM related career pathways and how to apply what they have learned in these sessions toward pursuing a career in STEM.

Appendix C: Overview of surveys and instruments

School Attitudes Survey-Revised

The *School Attitudes Survey-Revised* (SAAS-R; McCoach, 2002) will be used to measure task meaningfulness, self-efficacy, and self-regulation. Example items are "I want to get good grades in school" for task meaningfulness, "I am intelligent" for self-efficacy, and "I check my assignments before I turn them in" for self-regulation. All items are measured using a seven-point Likert scale. I will use the academic self-perception subscale to measure self-efficacy, $\alpha = .89$, the goal valuation subscale to measure task meaningfulness, $\alpha = .95$, and the self-regulation subscale to measure self-regulation, $\alpha = .91$. The SAAS-R has been validated with high school students (McCoach & Siegle, 2003) and has been found appropriate for use with middle school students as well (Ritchotte et al., 2014). Furthermore, the SAAS-R includes some questions regarding students' self-reported GPA, which will be used to measure student achievement.

School Engagement Measure

We will use the *School Engagement Measure* (SEM; Fredricks, Blumenfeld, Friedel, & Paris, 2004) to measure students' engagement. Example items are "I read extra books to learn more about things we do in school." and "I talk with people outside of school about what I am learning in class." These items are all measured using a five-point Likert scale. The SEM has three subscales, behavioral, cognitive, and emotional engagement with Cronbach's alphas of .77, .82, and .86 respectively. Concurrent validity was measured via zero-order correlations with perceptions of classroom context; all correlations were significant and in the expected directions (Fredricks et al., 2004).

Demographics and grade questionnaire

Participants will be asked to complete a demographics and grades questionnaire before taking part in the small group discussion sessions. This questionnaire includes questions about race, gender, age, identification as gifted and status of achievement, and some information about their GPA. Students will be asked to answer this questionnaire online.

Observation Protocol

A translated and adapted version of the *Leuvense Betrokkenheidschaal* [Leuven Engagement Scale] (Laevers, 1994) will be used to facilitate observations of student engagement in the classroom. The observation protocol lists nine signals of engaged behavior: concentration, energy, complexity and creativity, facial expression and posture, persistence, accuracy, reaction time, verbal expression, and satisfaction. The original protocol included a five-point scale on which these behavioral signals are scored as follows: (a) no activity; (b) often non-engaged activity; (c) more or less engaged activity; (d) activity with intense moments of engagement; and (e) consistent, intense activity. This five-point scale will not be used in this adapted version of the protocol. Instead, observers will be asked to establish the percentage of engaged behavior during one class period, by reporting engaged behaviors in five-minute intervals.

Interview Protocols

We will create semi-structured open-ended interview protocols to interview the teachers implementing our model and a subsample of students participating in the models. The questions in these protocols will be designed to provoke thought about either a student's or a teacher's experiences with the model. Sample questions will include "Tell me about some things you learned in the small group discussion sessions?" for the students and "Tell me about some activities or topics you found particularly useful from the online modules." for the teachers. All interview participants will be interviewed once after each Tier of the intervention concludes for approximately 45 to 60 minutes.

Teacher Perceptions Questionnaire

We will create a questionnaire to gauge teachers' perceptions of students with gifts and talents from different traditionally underserved populations. This questionnaire will include a series of Likert-type items as well as a series of vignettes with some short answer questions.

School Attitude Assessment Survey-Revised
© D. B. McCoach, University of Connecticut, 2002
Instructions: This survey should take approximately about 5 minutes to complete.
Part I: Please rate how strongly you agree or disagree with the following statements. In answering each question, use a range from (1) to (7) where (1) stands for strongly disagree and (7) stands for strongly agree. Please circle only one response choice per question.

Statement	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strc Agr
1. My classes are interesting.	1	2	3	4	5	6	
2. I am intelligent.	1	2	3	4	5	6	
3. I can learn new ideas quickly.	1	2	3	4	5	6	
4. I check my assignments before I turn them in.	1	2	3	4	5	6	
5. I am smart in school.	1	2	3	4	5	6	
6. I am glad that I go to this school.	1	2	3	4	5	6	
7. This is a good school.	1	2	3	4	5	6	
8. I work hard at school.	1	2	3	4	5	6	
9. I relate well to my teachers.	1	2	3	4	5	6	
10. I am self-motivated to do my schoolwork.	1	2	3	4	5	6	
11. I am good at learning new things in school.	1	2	3	4	5	6	
12. This school is a good match for me.	1	2	3	4	5	6	
13. School is easy for me.	1	2	3	4	5	6	
14. I like my teachers.	1	2	3	4	5	6	
15. I want to get good grades in school.	1	2	3	4	5	6	
16. My teachers make learning interesting.	1	2	3	4	5	6	
17. My teachers care about me.	1	2	3	4	5	6	
18. Doing well in school is important for my future career goals.	1	2	3	4	5	6	
19. I like this school.	1	2	3	4	5	6	
20. I can grasp complex concepts in school.	1	2	3	4	5	6	
21. Doing well in school is one of my goals.	1	2	3	4	5	6	
22. I am capable of getting straight As.	1	2	3	4	5	6	
23. I am proud of this school.	1	2	3	4	5	6	

24. I complete my schoolwork regularly.	1	2	3	4	5	6
25. It's important to get good grades in school.	1	2	3	4	5	6
26. I am organized about my schoolwork.	1	2	3	4	5	6
27. I use a variety of strategies to learn new material.	1	2	3	4	5	6
28. I want to do my best in school.	1	2	3	4	5	6
29. It is important for me to do well in school.	1	2	3	4	5	6
30. I spend a lot of time on my schoolwork.	1	2	3	4	5	6
31. Most of the teachers at this school are good teachers.	1	2	3	4	5	6
32. I am a responsible student.	1	2	3	4	5	6
33. I put a lot effort into my schoolwork.	1	2	3	4	5	6
34. I like my classes.	1	2	3	4	5	6
35. I concentrate on my schoolwork.	1	2	3	4	5	6

Part II: Please choose only one response choice per question.

1. What is your cumulative GPA? What are your average grades?
    - 4.0 or higher (All A's)
    - 3.75-3.99 (Mostly A's)
    - 3.5 to 3.74 (More A's than B's)
    - 3.25 to 3.49 (More B's than A's)
    - 3.0 to 3.24 (Mostly B's, some A's and C's)
    - 2.5 to 2.99 (More B's than C's)
    - 2.0 to 2.49 (More C's than B's)
    - 1.5 to 1.99 (More C's than D's)
    - 1.0 to 1.49 (More D's than C's)
    - Less than 1.0 (Mostly D's and F's)

2. On average, how much time *per week* do you spend doing homework?
    - Less than 1 hour
    - From 1 hour to less than 3 hours
    - From 3 hours to less than 5 hours
    - From 5 hours to less than 10 hours
    - From 10 hours to less than 15 hours
    - From 15 hours to less than 20 hours
    - From 20 hours to less than 25 hours
    - 25 hours or more

The School Engagement Measure

I follow the rules at school.	1	2	3	4	5
I get in trouble at school. (REVERSED)	1	2	3	4	5
When I am in class, I just act as if I am working. (REVERSED)	1	2	3	4	5
a	1	2	3	4	5
I complete my work on time.	1	2	3	4	5
I like being at school.	1	2	3	4	5
I feel excited by my work at school.	1	2	3	4	5
My classroom is a fun place to be.	1	2	3	4	5
I am interested in the work at school.	1	2	3	4	5
I feel happy in school.	1	2	3	4	5
I feel bored in school. (REVERSED)	1	2	3	4	5
I check my schoolwork for mistakes.	1	2	3	4	5
I study at home even when I don't have a test.	1	2	3	4	5
I try to watch TV shows about things we do in school.	1	2	3	4	5
When I read a book, I ask myself questions to make sure I understand what it is about.	1	2	3	4	5
I read extra books to learn more about things we do in school.	1	2	3	4	5
If I don't know what a word means when I am reading, I do something to figure it out.	1	2	3	4	5
If I don't understand what I read, I go back and read it over again.	1	2	3	4	5
I talk with people outside of school about what I am learning in class.	1	2	3	4	5

Demographics and Grades Questionnaire

Please tell us a little bit more about yourself. Thank you for taking a few minutes to complete this questionnaire.

First name: _____
Last name: _____
Date of birth: _____
Gender: _____
Grade: _____
School: _____
What race or ethnicity are you? (Select all that apply)

- White
- Hispanic or Latinx
- Black or African American
- Native American or American Indian
- Asian
- Native Hawaiian or Pacific Islander
- Other: _____

What is your current GPA? _____
What is the highest your GPA has been so far? _____
What is the lowest your GPA has been so far? _____

Do you feel your GPA reflects your ability?

- Yes
- No
  Please explain why or why not.

Are you gifted, creative, or talented?

- Yes
  If yes, Were you formally identified?
  - Yes
  - No
- No

When your grades do not reflect your ability, you may be underachieving. Based on this definition, do you think you are underachieving?

- Yes
- No
  Please explain why or why not.

What do you think causes students to not achieve as well in school as they could? Please give at least five reasons.

Engagement Observation Protocol

This document intends to help guide the daily engagement observation. Before you start the observation, read through the definitions and instructions to get a better idea of what engaged behavior looks like. This observation protocol is a translated and adapted version of the *Leuvense Betrokkenheidschaal* (Laevers, 1996).

Instructions

1. Prepare by filling out the information on top of the next page.
2. Set a timer for five-minute intervals.
3. Observe the students engaged behavior using the descriptions below. Each five-minute interval, indicate if the student was engaged the whole five minutes (i.e., mark yes). If the student was not or only partly engaged, mark no.
4. If the student is not being observed during an interval (e.g., s/he steps out for a bathroom break or the class ends early) indicate by putting down NA.

Definitions

Engagement is defined by seeing one or more of the following behavioral or verbal signals:

1. Concentration

   The student is paying close attention to the activity at hand. Only intense stimuli can defer the student's attention from the task at hand. It is essential to pay close attention to a student's eyes; when the eyes are no longer locust on the task at hand, the student has lost engagement.

2. Energy

   Energy can manifest by speaking loudly, wanting to finish a task quickly, but thorough. For example, imagine a student working while sticking out his or her tongue.

3. Complexity and creativity

   When a student expresses creative behaviors, such as elaborating or synthesizing.

4. Facial expression and posture

   Focus on a student’s expression and body language to determine if he or she are engaged.

5. Persistence

   Do you see persistent concentration?

6. Accuracy

   How accurate are the student's responses to prompts? Higher accuracy indicates higher engagement.

7. Reaction time

   Quick reaction time to stimuli related to the activity indicates a higher engagement. However, if the student shows a fast reaction time to outside stimuli (i.e., stimuli unrelated to the task at hand), this indicates lower levels of engagement.

8. Verbal expression

   Any verbal expressions that could indicate engagement in the activity (e.g., the student asks questions, actively participates in class, etc.)

9. Satisfaction.

   Any indications (verbal or non-verbal) of the student's satisfaction with his or her work.

Student (first and last name): _____

Observer name: _____

Date T1: _____ Date T2: _____ Date T3: _____

Time T1: _____. Time T2: _____. Time T3: _____

Week Nr. ____

T1	The student was Engaged		T2	The student was Engaged		T3	The student was Engaged	
	Yes	No		Yes	No		Yes	No
5'			5'			5'		
10'			10'			10'		
15'			15'			15'		
20'			20'			20'		
25'			25'			25'		
30'			30'			30'		
35'			35'			35'		
40'			40'			40'		
45'			45'			45'		
50'			50'			50'		