KEMET Academy: A University Outreach Model for Addressing the Wholeness of Learning in a Rural Context

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Abstract
This work introduces a model of university outreach in rural communities which promotes increasing post-secondary options for rural dwelling African American youth. KEMET (Knowledge and Excellence in Mathematics, Equilibrium, and Technology) Academy is a comprehensive academic enrichment program targeting African American students enrolled in under-resourced schools and communities across Alabama's rural Black Belt region. The group comprised 48 intermediate level students in four counties. Drawing upon professors representing two land grant institutions, KEMET faculty engaged KEMET Scholars in activities designed to enhance skills in reading comprehension and application, mathematics, science, computing, decision-making, as well as health and wellness during a two-week summer program and tri-monthly "Saturday Academies" annually, for over a five year period. Facilitators of the program found it effective in meeting its overall objectives of enhancing the academic and cultural enrichment experiences of rural youth.

Keywords: Knowledge, Excellence, Mathematics, University Outreach, Technology

Introduction

Scholarship and practice initiatives over the past 30 years focused upon factors associated with children at-risk becoming teen parents or drug abusers, entering organizations which promote deviant behavioral standards, becoming physically aggressive or emotionally unstable, or other forms of delinquency. While important these factors, represent only a small portion of the story, rendering remaining issues ignored.

To a great extent, the discussion and research specifically on at-risk African American youth have been restricted to their portrayal as social problems or "problem" youth. Contrarily, some African American children coexist in the same contexts of troubled peers, displaying high levels of competence and cognitive productivity. As a result of few investigations on these healthy and resilient African American youth, little knowledge has been developed related to their motivation; personality norms; psychological, cognitive, identity, and moral development; attitude formation; and relationships with parents, siblings and significant others. Limited research exists about these youth, who despite their economic circumstances, experience success exhibited by feelings of hope and self-worth, resilience and competence, academic achievement, as well as maintenance of overall positive emotional health (Crain & Dunn, 2007; Donnelly, Eburne & Kittleson, 2001; Gopaul-McNicol & Thomas-Presswood, 1998; Phinney, 1990; Smith, 2002).

Knowledge and Excellence in Mathematics, Equilibrium, and Technology (KEMET) Academy targets African American students enrolled in under-resourced Black Belt region Alabama schools. The students in the Black Belt region reside in the poorest counties of the United States, with declining populations that are primarily agricultural with low-density settlement, high unemployment, limited access to educational resources or quality medical care, substandard housing, and high rates of crime (Gibbs, 2003; Zekeri & Habtemariam, 2006). The program seeks to improve the academic achievement and overall success of participants, offering opportunities for learning and personal growth to young residents of the Black Belt. Programmatic sub-goals include: 1) raising the academic achievement levels and graduation rates of children attending schools in under-resourced communities; 2) increasing the number of children from Alabama's under-resourced schools who pursue post-secondary education or training; 3) raising the number of under-represented minorities pursuing careers perceived as non-traditional; and 4) improving the likelihood that these students will return to their home communities and contribute to the communities' sustainability and growth. Furthermore, this pilot evaluation yields data identifying factors promoting higher levels of self-efficacy, achievement, and hope among rural dwellers, while informing policies and programs dedicated to increasing opportunities for members of the featured population.

The authors present KEMET Academy as an intervention for rural youth and a competency model based upon the program. Outcomes of the program yielded the development of the KEMET Competencies Associated with Success for Rural Youth (CASRY), a model which may be applied to other university outreach efforts serving similar populations. These competencies included general literacy, computational skills, analytical skills, computer literacy, communication skills, self-evaluation, cultural literacy, goal development, values clarification

and identity, expectations, having two or more non-parent invested adults, global citizenship, and physical and emotional health.

A review of the relevant literature for each program component follows. The authors then present KEMET Academy as an intervention for rural youth and a competency model based upon the program which may be applied to other contexts.

Review of the Literature

The multifaceted nature of this initiative requires review of related elements to place the work in context. The following reviews academic achievement, reading and literacy, mathematics, science, physical health and fitness, and emotional and mental health as it relates to the featured population.

Academic Achievement

Numerous explanations exist for the over-representation of African Americans among those failing to meet academic standards in public schools throughout the United States. This contributes to the under-representation of African Americans in higher education. These explanations range from attending under-resourced schools, to a lack of culturally adept educators (Ladson-Billings, 1996). The intersection of dynamics including race, poverty, and gender contribute to the challenges these children face in high need public schools.

Representing 15% of the nation's youth, African American adolescents, as members of a marginalized group, continue to experience inequities and are disproportionately vulnerable to many of life's harsh realities – realities which may impede their academic achievement, emotional maturity, and physical development (Lewis, 1988; Rogers & Hughes-Lee, 1992). Rural Alabama, despite some improvement in recent years, remains a statistically dismal place to reside for children. The Annie Casey Foundation (2005) measured the rate of rural Alabaman children living in poverty at 24 percent; while 14 percent of children between the ages of 16 and 19 discontinue school before attaining a high school diploma or certificate. Both of these statistics exceed the national average.

In the Black Belt region of Alabama's Lowndes County, where African Americans are the overwhelming majority (73.4%) of residents, Black youth continue to be disproportionately represented in the 20.5% of student drop outs annually, as well as the 471 students who are suspended every year. The 79.5% who do graduate see a gloomy horizon with few economic opportunities. Further, the families to which these youth belong fall at the lower end of the median household income range, with an average income of $24,967 – over $13,000 less than the state's average of $34,135 (U.S. Census Bureau, 2004). As is characteristic of Alabama's Black Belt rural counties, Macon County's median household income is lower at $23,378 – over $14,000 less than the state's average (U.S. Census Bureau, 2000). Russell County's median household income is $29,680 – over $7,000 less than the state's average. Lee County, though boasting a higher than average median household income at $34,660, still has its African American residents representing the lowest median household income in the area (U.S. Census Bureau, 2004).

When we consider that over 30 % of Macon County's and 35 % of Lowndes County's adult residents over the age of 25 lack a high school diploma or its equivalent, it is clear that these children are in a precarious position. In 2003, only 19 and 22 % of Alabama's fourth graders scored above the reading and math proficiency scores, respectively. As one would suspect, the prospects don't improve by the time these children enter the eighth grade and diminish even further as it relates to math competency, where they exceed the reading and math proficiency scores by rates of only 22 and 16 %. Even more frightening is the %age of students who were not successful in passing the Alabama High School Graduation Exam (AHSGE). For example, over 30 % of the students tested in Lowndes County's high schools failed the math portion of the exam in 2006. Furthermore, the racial and economic isolation symptomatic of rural communities means that participants are rarely exposed to models of academic success within their rural contexts.

Phinney (1990) identifies positive identity development as a mediator between poverty and behavioral outcomes, such as academic grade point average, delinquency, and psychological well-being for ethnic minorities. It is also directly associated with higher levels of resilience, greater self-awareness, positive self-esteem and greater overall academic success. In regards to self awareness and esteem, assisting their children with developing cultural connectedness is one of the most important parental tasks identified by African American parents (Bowman & Howard, 1985). Seaborn-Thompson and Peebles-Wilkins (1992) report that social connectedness provides affirmation that increases self-worth and the capacity to cope with negative self-imagery, racial hostility, and rejection by the larger society. The extent to which African American youth value themselves has a substantial influence on whether they are able to develop self-efficacy and resilience in the face of negative life events, barriers, and societal devaluation. Such characteristics promise to increase the likelihood that they set and attain academic and personal goals.

Though there continues to be a great deal of conflict related to which factors contribute most to or promote academic achievement among rural dwelling children, some Scholars do identify parallel factors (Hodgkinson, 2003; Hodgkinson & Obarakpor, 2007; Seaton, 2007; Yang & Fetsch, 2007). They agree that rural school aged children benefit from adequate facilities and materials, well trained teachers, educational stimulation, and exposure to an education supplying a foundation for successful lives. Children need their teachers and families to believe in their abilities, support their development, inspire confidence in their abilities, and believe that regardless of impoverished educational environments that they can be successful.

Reading and Literacy

Reading and comprehension lie at the foundation of academic endeavors. According to the Lowell Bennion Community Service Center (2007) many students' reluctance to read and comprehend information stems from lack of exposure to reading materials to which they personally connect. All of us are more likely to read and struggle to understand difficult material if we see ourselves reflected in the literature. Some of the major barriers to reading include lack of ownership and connection to materials that are selected for reading, as well as frustration. Hence, not only do students need to connect to the materials, but materials need to be at the appropriate level for students. When learning to read, a student's lack of confidence in his or her

ability may also hinder learning. By creating an environment where the student feels safe and supported, they are more willing to take risks to read. Boredom with the same routines and stories pose as another reading barrier. Opportunities need to be provided to mitigate these potential obstacles to reading success to provide students with better conditions for learning that strengthen reading ability.

Mathematics

Inequities remain across racial, gender, and socio-economic lines in mathematics achievement (NAEP, 2007). Hence, the vision described by the National Council of Teachers of Mathematics (NCTM , 2000) aims to empower all students to become quantitatively literate problem solvers. Students can be empowered by actively constructing knowledge, making connections to the real-world, and using mathematics as a tool to examine social justice (Banks & Banks, 1995; NCTM, 2000). Proportional reasoning is often identified as the common thread in middle school mathematics as it "consolidates elementary school mathematics knowledge and … forms a cornerstone for high school mathematics and science" (Lamon, 1996, p. 172).

Science

Encouraging students to develop positive attitudes toward science is a critical part of learning the subject (Claxton, 1989; Head, 1989; Joranovic & King, 1998). Jovanovic and King (1998) explain that students' attitudes are linked to their achievement in science, as well as motivation to persist in high school science courses and beyond (Kahle & Meece, 1994; Steinkamp & Mehr, 1983; Stoner 1981). Yet, national trends indicate that middle school marks the period when some students lose interest in the subject (Jones, Mullis, Raizen, Weiss, & Weston, 1992). Advocates of science education reform believe that to better engage students in science, learning must transcend a traditional textbook-focused approach, where students learn by listening and reading; to a performance-based (i.e., hands-on) approach, where learning is an active process involving inquiry and exploration (American Association for the Advancement of Science [AAAS], 1990; National Research Council [NRC], 1996). These recommendations are predicated on the tenet that if students are given opportunities to actively engage in science, positive attitudes towards science and higher levels of scientific efficacy will be fostered (Hofstein & Lunetta, 1982, Kahle, Parker, Rennie, & Riley, 1993; Okebukola, 1986).

African American students from under-resourced communities tend to discontinue their matriculation in non-compulsory science courses earlier and at greater rates than their European American counterparts. Primary obstacles for these students include inadequate education, low expectations from teachers, anti-intellectual peer pressure, and a cultural gap between the world of research and that of their families (Culotta, 1993). Addressing this leak in the science pipeline requires early intervention.

Research has shown that students in middle school begin to form opinions about their future careers. Educators may intervene with students during the middle school or transition years to encourage interest in science by: showing them that science will be useful in the future; exposing them to science and engineering role models of the same sex and /or ethnic

background; encouraging parents and peers to excel in science; and providing opportunities for confidence building and enhancing existing strengths.

Parker and Gerber (2000) in their research of science intervention on middle school student achievement support the need for reformation of science curriculum as recommended by the National Research Council (1996). Essential components of a science curriculum are appropriate content based on national goals for science education and an inquiry-based, active learning instructional method. Both of these curriculum components are considered necessary for the development of student achievement and positive attitudes toward science (Parker & Gerber, 2000).

Physical Health and Fitness

Obesity and being overweight are major risks that contribute to many health concerns plaguing Americans. Sixty-four percent of Americans are overweight, defined as holding a Body Mass Index (BMI) of 25 or more (U.S. Federal Food and Drug Administration, 2002). Alabama is identified as one of the top five most obese states in the country. According to the Annual Report for the Alabama Department of Public Health (2005), 65% of Alabama adults are overweight. Nearly 44% of adolescents are at risk for being overweight based on the Alabama Obesity Task Force's report (Alabama Department of Public Health [ADPH], 2008).

Contributing to rising obesity problems among youth in the State of Alabama are alarming statistics that indicate that 81% of youth are not receiving adequate, "moderate" daily physical activity. In addition, approximately 59% do not participate in physical education courses in school (ADPH, 2008). The Alabama Obesity Task Force notes that nearly 86% of high school students do not eat 5 or more fruits and vegetables daily. Consequently, we see a higher prevalence of obesity-related illnesses, including heart disease, hypertension and diabetes among children. Consequently, heart disease, an illness related to obesity, is the number one cause of death in Alabama, accounting for approximately 29% of deaths in the state during 2002 (Kochanek, Murphy, Anderson & Scott, 2004).

The crisis of obesity demonstrates the importance of starting exercise habits at an early age and encouraging a balanced diet. Undernourishment, regardless of weight, negatively influences children's school behaviour and performance, particularly concentration and performing complex mental functions (Center on Hunger, Poverty, and Nutrition Policy, 1994). Also, because of the link between stress, lack of exercise and "comfort eating," it is critical to include stress management strategies in promoting physical and mental wellness.

In terms of physical wellness, research suggests that recess increases children's cognitive performance via increasing student attention (Pellegrini & Bohn, 2005). This counters arguments minimizing the importance of physical activity and that seek to replace recess and physical education with increased class time for courses (Kean, 1990) such as mathematics and science. Yet, the Society for Neuroscience ((SFN), 2007) reports that exercise influences the hippocampus, resulting in increased memory and learning (SFN, 2007). Research further suggests that physical activity plays a vital role in overall brain function and maintenance and that the brain generates new cells throughout the lifespan (SFN, 2007).

Emotional and Mental Health

The development of positive emotional health and well-being is what children need for optimal psychosocial development (Crain & Dunn, 2007). But the management of emotional and mental health often is ignored in rural communities. The stigma attached to mental health services further limits willing African American parents and caregivers in pursuing mental health interventions for their children (Corrigan et al., 2007; Simmons, Huddleston-Casas & Berry, 2007). A tendency to perceive mental or emotional challenge or stress as a weakness, further contributes to lack of utilization of mental health services that can prevent emotional and mental dysfunction and serve as intervention for behavioral problems (Corrigan et al., 2007; Gyamfi, Keens-Douglas & Medin, 2007).

The mental health community and most recently the educational community have made attempts at identifying factors that contribute to the development of positive emotional well-being (Reading, 2007). The ability of an individual to successfully express emotions appropriately would be an indication that positive emotional health had been achieved (Donnelly, Eburne & Kittleson, 2001). However, a question that is most often asked is: What are the factors that contribute to positive emotional health? Can they be identified and incorporated into parental interactions and an educational mental health intervention to facilitate emotional development? According to Smith (2002) there are several factors that contribute to this development, occurring at individual, familial, and societal levels. When destructed and viewed individually, these factors have multiple influences. The community factors noted to have significant influence on the development of the child's emotional health can include such things as having external support, good housing, basic needs being met, and schools. Within the community, opportunities for achievement and involvement in academic and leisure activities can have a profound impact on emotional well-being. With each of these opportunities to contribute and participate in the community, the child develops skills such as managing strong feelings, resolving conflict, as well as making and maintaining friendships. These are developed amidst building a positive sense of mental health. While the community plays a role, contributing factors to the emotional health of a child are the parents or guardians and caregivers. The familial factors that contribute to this well-being include support, affection, lack of tension, and involvement in family activities. However, the personal factors of a child can also be profound in the promotion of emotional health. Personal factors that have been identified as contributing to emotional well being include good health, a positive self-concept and identity, language development, communication, problem solving skills, biological resilience, secure attachment, temperament, exposure to pro-social behavior and IQ (Crain & Dunn, 2007; Smith, 2002). It was also noted that personal factors such as being female, humor, religious faith, and feeling in control could also be significant influential factors in promoting positive emotional health of a child.

The multiple factors that contribute to a child's emotional wellness are each significant. To dismiss contributing elements and attempt to measure the positive emotional health in the absence of a mental or physical illness would be inadequate. However, in its true essence, positive emotional health and well-being should be viewed in terms of the child's ability and capacity to live a full life.

Methods

The initial participant group comprised 48 students entering the sixth and seventh grades. Participants were recruited from four rural counties in the Black Belt region of Alabama. Letters and telephone calls of introduction were made to superintendents, school principals, and guidance counsellors. We solicited support from area community leaders. After approval was secured from the county superintendents, school principals were instructed to select 15 students from the identified school with 5 having C/D grade averages, 5 holding B/C averages, and 5 earning A/B averages. Students with diagnosed severe learning disabilities or conduct disorders were excluded from participation. The resulting group comprised 28 sixth graders and 20 seventh graders. The second year of the KEMET Academy Summer Program experienced some attrition, with 22 seventh graders and 12 eighth graders. One of the participants had a diagnosed learning disability and physical development challenge, two were diagnosed with juvenile diabetes, and one was diagnosed with kidney disease. The parents or guardians of each child participated in an orientation meeting held at the school and completed informed consent forms along with their children.

Journaling was used to record experiences and reflections. Journaling prompts researchers to be more reflexive (Janesick, 1999; Mertens, 2009) and facilitates "deepening knowledge of whatever subject matter the researcher takes part in," while serving as a member check for one's thoughts (Janesick, 1999, p. 522). Journal writing allows "individuals [to] become connoisseurs of their own thinking and reflection patterns, and indeed their own understanding of their work…" (p. 506, 1999). Other sources of data included letters from parents and class assignments.

Intervention

This intervention pilot targeted the academic skill development of KEMET Academy participants in the following areas: reading comprehension and literacy; mathematics; computing and science; visual arts; emotional and mental health, and finally, physical health and fitness. The curriculum units have diverse thematic concentrations in an effort to enhance the Scholar's exposure to curricular content as required by the State of Alabama. Over a three year period the thematic threads included foci on rural West and Central Alabama, the development of the United States from 1400 through 1959, and science. The faculty developed each topical area to focus on some aspect of the theme. Since 2004, for two weeks each summer, KEMET Scholars attended rigorous classes and seminars for six hours daily, Monday through Friday. The classes were held on the campus of a public, land grant university in Alabama. The Scholars also participated in quarterly Saturday Academies which focused on one of the target areas and included at least one hour of recreational activity. Because the targeted rural communities reflect statistics suggesting that certain populations experience disproportionate cases of obesity and juvenile diabetes, the program integrates components focusing on increasing self-efficacy, self-awareness, and wellness. The intervention's academic components were chosen based on a review of the students' academic records and standardized aptitude test scores. The academic courses included reading comprehension and literacy, mathematics, computing and science and art entitled, Myself in Literature, Computing and Mathematics, and Visual Arts. These were

supported by the physical health and fitness class, Healthy Hearts, as well as an emotional and mental health component, Learning for Life. A description of each course follows.

Reading Comprehension and Literacy: Myself in Literature

Students read literary works and participated in discussions that sought to expand their comprehension of literature which reflected their experiences. They developed their own stories in writing and presented rationales for story dynamics. The specific objectives of the Myself in Literature course was to: 1) increase students' reading comprehension skills; 2) promote knowledge of self and develop cultural literacy through literature; and 3) expose them to reading materials that promote deductive and inductive reasoning skill development. Texts were chosen with special emphasis on cultural relevance and age specificity. These factors increased Scholars' engagement in the course and its related activities. The following represent the Scholars' reflections which best exemplify some their success experiences in Reading Comprehension and Literacy: Myself in Literature.

11th Grader, Lowndes Co., Female:

> I remember when I had to write one poem about myself and another about nature. This helped me learn about the different types of poems.

10th Grader, Tallapoosa Co., Female:

> Today we are in North Carolina. We visited the museum of the Cherokee Indian. We learned how to say "hello" and sing Amusing Grace in Cherokee. After we left there, we had a picnic. It was very nice.

Through exposure to poetry and another language, the students moved beyond their classroom experience in the rural setting. This enrichment promises to enhance future learning in regards to literacy.

Science: Principles of Rocketry

In the science class, Principles of Rocketry, Scholars: 1) learned and applied the basic principles of how humans explore outer space; 2) investigated the three laws of motion with straws, paper, scissors, and tape; 3) constructed a paper rocket and rocket balloon powered by air generated in the lungs; 4) designed lessons about rocketry; and 5) built and launched rockets powered by small engines.

KEMET Scholars were administered a questionnaire at the beginning of the camp about physical science based on concepts from the state standards for students in the 5th grade. The questions solicited answers based on forces and motion, which is part of the National Science Education Standard (NSES), Physical Science and the Alabama Course of Study (ALCOS) standards for forces and motion in 5th grade science. Student's responses showed that they lacked an understanding of the relationship of forces and motion as it related to the basic concept of how objects move and travel a distance in space.

By learning more about forces, such as gravity, KEMET students were able to explain why a marble falls faster than a piece of paper and why you weigh different amounts on different

planets. Questionnaire data suggests that students were more excited about science by the end of each summer camp.

Students were free to manipulate materials, discover, and explore, as well as pursue questions and ideas. Students recorded observations and data, working either individually or in small groups. The instructor assumed the role of facilitator, observing, asking questions, and making suggestions.

In the concept's introduction, under the direction of the instructor, students organized data they collected and looked for patterns that appeared in regards to forces and motion. In concept application students were given a new situation or problem to which they applied the information they learned through discovery and research. This phase usually involved additional hands-on activities that reinforced earlier learning.

KEMET science proved successful in that students were taught in an inquiry-discovery classroom. Hands on activities were used and integrated with science content. Lesson plans designed by the instructor utilized the learning cycle model. This model approaches teaching and learning via student involvement in the types of thinking and inquiry that constructivists argue facilitates productive learning (Martin, Sexton, Franklin & Gerlovich, 2005). The following illustrate the Scholars' reflections related to their work in Science.

11th Grader, Lowndes Co., Female:

> I remember my first year when I learned about the different ecosystems and how plants and animals interact in nature. I learned about fish adaptations and how butterflies are adapted to their environment.

10th Grader, Lowndes Co., Female:

> In geographical information systems, I learned how to measure distance between cities. This information increased my knowledge about social studies and GIS. When we got to South Carolina, we got into groups to complete projects. This is an example of Umoja (Unity).

These students' inclusion of science related topics in their journals suggest their engagement with the summer program's curriculum in the area. Given the scarcity of racial minorities in this field, the success of the initiative to spark interest in the discipline is commendable.

Computing and Mathematics

Students explored various facets of Alabama's eighth and ninth grade curriculum, including algebraic reasoning, geometry, and data analysis. Hands on activities introduced the concepts of ratio and proportion. Examination of quilts and quilt making were used to introduce geometric concepts. Specific objectives of the Mathematics course included increasing students' quantitative literacy, flexible problem solving development, and proportional reasoning skills. The Scholars also participated in a "Math Bowl" which encouraged the girls and boys to work in teams. The majority of the Scholars appeared to be intimidated by Mathematics, including simple computational skills which they should have mastered three to four years earlier.

Additionally, the Scholars worked with university computer science and software engineering graduate and undergraduate students for one hour daily to review personal productivity software, computer technology, and to be introduced to website creation and development. The participants cooperatively created a website documenting their experiences while exploring the culture and history of Alabama. The Scholars also were introduced to a program, EthnoMathematics, in which they reviewed and were introduced to the mathematical concepts of transformational geometry, ratios, proportion, angles, iteration, geometric sequence, Cartesian coordinates, logarithms, 4-fold symmetry, and Culturally Situated Design. EthnoMathematics entailed learning mathematics while investigating different eras of history and cultural aspects of the subject. One specific assignment looked at "cornrow braiding" and its connections to transformational geometry to instruct the students in concepts of scale, rotation, symmetry, and iteration.

The lessons for computer sessions were designed to increase students' competency in computing and technical efficacy. They completed assignments related to African American culture which were presented by the students in Microsoft Word and Powerpoint. Units were prepared to instill in participants the importance of respecting the rights of all people and to prepare them for future leadership. Computing sessions also integrated broader program goals which sought to increase students' problem solving skills, computing and mathematics efficacy, and self efficacy in terms of public presentation of their projects.

During the 5th year of the summer enrichment programming, the KEMET Scholars' performance improved over previous years and required less direct instruction. For the majority of students, the computing professor noted changes in cognitive and emotional maturity or the chronological stages of older Scholars, which is required to effectively problem solve, prioritize, and focus on the detailed task oriented activities assigned.

Unfortunately, for those activities that required pre-existing foundational mathematical skills such as basic Geometry, 8 of the younger Scholars exhibited little persistence and would often become distracted themselves or a distraction for their peers. One application utilized transformation geometry and iteration (i.e. Cornrow Curves). All of the students lacked the foundational background to complete any information on their pre-test activities, which assessed basic geometrical topics (i.e. reflection, iteration, rotation, etc.). However, the post-test results indicated marked improvement with the majority (27 out of 34) of the students acquiring some knowledge of these concepts and exhibiting the ability to apply them.

In relationship to basic computing activities, many of the students were below expected grade level in competencies that support computing (i.e. keyboarding). Yet a few of the students were well versed in these skills. Despite diminished preparation in basic mathematic and computation concepts, the majority of students performed well in creative and problem solving activities required in computing fields. This indicates that students need to strengthen their mathematical backgrounds. Despite this, the computing instructors found that many of the students were creative and possessed the cognitive capacity to pick up new activities quickly when they were culturally centered.

Another method employed was to direct the students in creating web pages utilizing end-user programming techniques. This is a strategy utilized to train novice programmers to build their concepts creatively and systematically without imposing the barriers of having to learn the underlying programming language. With this technique, all of the students were able to create basic webpage's and some of the students with high aptitudes for computing technology were able to present structurally pleasing presentations in web technologies as well as in Microsoft PowerPoint for presentations on their work during the Academy.

The following shares one Scholar's reflection exemplifying her experiences in Computing and Mathmatics.

11th Grader, Lowndes Co., Female:

> I remember when I worked with geometric shapes. From this, I gained knowledge about the different patterns and shapes that you can form. I also remember my first year at Camp KEMET when I learned how to create a video game. From this, I learned that technology is becoming very important in the world and in our lives.

Like the science segment of the curricula, the computing and mathematics component drew students into the application of these fields and their importance in daily life. Such an approach has yielded the above student's appreciation for these disciplines.

Visual Arts

The goals and objectives of the visual arts class entitled, Art and Culture, included: 1) art appreciation, 2) the creative process 3) art production and 4) enhancement of artistic efficacy. Scholars were introduced to several concepts and vocabulary pertaining to the visual arts. University pre-service educators worked with Scholars in small groups to provide individualized instruction, demonstrating each lesson in detail and verbally encouraging the students. The goals and objectives of the visual arts class were introduced via the three following lessons:

Quilts of Alabama: Composition and Design. Using visual examples (art appreciation) of traditional European (symmetrical designs and compositions) and African-American quilts created in Gee's Bend Alabama (asymmetrical designs and compositions) the concepts of symmetry and asymmetry were explored. Scholars demonstrated their understanding of art and related mathematical concepts through their planning and creation of symmetrical or asymmetrical paper quilt collages composed of primary and secondary colors.

Weaving. Ghana's Asante ceremonial woven Kente cloth was incorporated into the second lesson. Scholars followed detailed instructions and employed fine motor skills, creating a simulated woven 'cloth' of yarn using a loom of drinking straws. Finally, the Scholars viewed the educational video, "Five African Art Facts," from the Virginia Museum of Fine Arts. In concert, these activities promoted the Scholars' understanding of the utility and types of traditional African art and materials. After discussion of the video, Scholars demonstrated knowledge acquired from the video into the creation of symmetrical or asymmetrical collages inspired by African masks.

At the conclusion of each year's summer camp, Scholars' artwork was displayed in the gallery of the University's Art department while KEMET was in progress and later in a gallery style exhibition during the culminating activity. These exhibitions fostered a sense of accomplishment, increased Scholars' self-esteem and garnered comments of recognition and appreciation from family members and viewers.

The following represent one pre-service educator's and a Scholar's reflections on their success experiences in Visual Arts. They include demonstration and reinforcement of knowledge learned, including feelings of empowerment, pride, increased self-esteem, and community.

Undergraduate Pre-service Educator:

> … two of the boys that I taught how to straw weave were teaching their friend how to do it because he hadn't started yet and all of the teachers were helping other students... I expected to have to teach each individual student how to straw weave, but they proved me wrong and ended up taking the responsibility to teach a classmate and looked like the(y) even enjoyed it!

Noteworthy here is the students' utilization of peer mentoring in helping another student learn.

9th Grader, Lowndes Co., Male:

> Today we arrived in Washington D.C. We got to tour the capital and walk. We walked to the Smithsonian, and walked from floor to floor just admiring the art work.

The clear articulation of appreciation for architecture offers a demonstration of the interest held by the student related to visual artwork. Such experiences are bound to supplement their educations given the limited attention to the visual arts in public school settings.

Emotional and Mental Health: Learning for Life Skills

These group sessions were an essential component of the KEMET Academy program. The one hour, tri-weekly group sessions enabled group leaders to motivate and interact with students. Group leaders with backgrounds similar to those of students served as role models and shared their personal paths to success, including obstacles. During these group sessions, through various activities, discussions, and role-plays, students explored and learned: skills in communication and cooperation; gender issues and relationships; time management; decision making; problem prevention and problem-solving; self-esteem and self-control; as well as value identification; peer leadership and team building; violence prevention: conflict identification, management and resolution; and stress management. Group sessions focused on themes such as: "The Law & Me," "Ethnic Heritage and Cultural Identity," "What Is Freedom?," "Respecting Differences," "Who am I … Who do I Want to Become," "Inter-gender Relationships," and "How Do I Say No?" The lessons were designed to instill in participants, the importance of respecting the rights of all people and to prepare them for leadership. The group sessions sought to accomplish heightened student awareness of social and life skills needed to: 1) achieve self-sufficiency and enhance personal development; 2) identify guiding values and ethics; 3) increase self-efficacy; 4) increase self-awareness and self-knowledge; 5) acquire a context for

understanding the importance of their own knowledge, skills, and overall education; and 6) identify characteristic features of mental health and wellness.

For the past five years, KEMET Scholars have participated in peer sharing and process-oriented groups. Foci of the groups centered upon many of the Scholars' developmental concerns and experiences they had between the 6th and 10th grades. Age specific tendencies have been observed as both a challenge and success for the group. They initially had difficulty accepting alternative perspectives about topics (i.e. conflict resolution strategies). However, as the Scholars matured in age and life experience, they seemed more empowered to share in groups and present themselves positively. An observed success included the increased level of insight Scholars gained from being exposed to life issues expressed in the group. Another distinctive marker of success was Scholars' ability to introduce themselves, articulate personal philosophies to the group, and complete group tasks without interruption and minimal formal structure. While they are still teenagers, the Learning for Life class allowed the Scholars to demonstrate self-determination and served as a venue conducive to their being capable of demonstrating ways in which their positive personal identity formed. Demonstrations of Emotional and Mental Health or Learning for Life are as follows:

10th Grader, Montgomery Co., Female:

> I have learned that being successful is very important. I have learned that I have to set a goal and strive to reach it.

11th Grader, Lowndes Co., Female:

> I learned that it's nothing wrong with being black.. . I learned that culture has a unique background to it. Also, I learned that we are all not the same. So this is how this principle relates to what I learned today.

11th Grader, Tallapoosa Co., Female:

> I learned that back in the 1800's people couldn't vote. Also, I learned about how women couldn't really do anything back then either. This relates to me, because I'm a young woman. The women's right was something that relates to me. That's my history, because if it wasn't for them, I wouldn't be able to vote. Also, I wouldn't be able to get a job. In conclusion, I wouldn't be even be able to leave the house...

10th Grader, Macon Co., Male:

> Today we visited Charleston, SC. We toured a few historical sites. The most memorable sight was Drayton Hall. I learned that the colors indicated what regiment each soldier was from. During the wars, self-determination was provided by the American soldiers to distinguish themselves from others. This shows that they wanted to stand out from each other and not get confused. This relates to me because, at times, I should stand out from others to be exclusive.

The learning prompted understanding of history and how this relates to their current places in society. This understanding generated pride and self esteem.

Physical Health and Fitness: Healthy Hearts

As we assessed the academic needs of participants in the program, we were cognizant of the social, physical, and emotional balance necessary to support academic success. Consequently, we decided to implement a holistic model of academic and social enrichment including attention to physical wellness. The Healthy Hearts component was designed to promote physical health, psychological wellness, and emotional balance in students with the intention of having a direct impact on their educational success. The goals of the Healthy Hearts sessions included: 1) introducing culturally embedded physical activity and food preparation practices; 2) improving strength and flexibility; and 3) enhancing stress identification and management skills. Specific objectives of the Healthy Hearts course were to: 1) increase students' knowledge of physical, psychological, and nutritional risk factors for being overweight or obese; 2) promote effective problem-solving and stress management skills; and 3) increase students' daily physical activity.

KEMET Academy incorporated the recommended sixty minutes of daily physical activity required for a healthy child (Department of Health and Human Services, 2007). As an element of the Healthy Hearts initiative, yoga was incorporated into each session. The benefits of yoga include strengthening the muscles, increasing flexibility, and promoting emotional well being. Science was infused into each yoga session, via sharing the specific health benefits of the varied yoga poses and how they affect the body. To complement yoga practice, West African dance was taught to the Scholars during the final minutes of each class. The goal of this segment of the Healthy Hearts course was to introduce Scholars to ancient traditions, yoga and traditional African dance, as vigorous sources of exercise and tools to promote cultural awareness and global citizenship. These practices were coupled with a focus upon linking the benefits of both biology and health.

Reintroduction to play was also incorporated during these sessions. The many demands of middle school students to become young adults minimize the attraction of physical play. Hence, the male and female Scholars were introduced to non-competitive outdoor activities, such as Double Dutch and single rope jumping, walking and team building exercises. The following represent the Scholars' reflections on their success experiences in physical health and fitness.

11th Grader, Macon Co., Male:

> I remember the first year where we learned African dance. We made up our own dance for the graduation ceremony and performed it. That was scary but fun and healthy.

10th Grader, Macon Co., Female:

> I have learned that being healthy is very important.

Given the rates of obesity in this community, early understanding of the importance of physical activity is critical. Such healthy practice benefits both the body and the mind.

Keystone Intervention Exemplars

Scholars and parents reflected on their overall experiences. These include a demonstration and reinforcement of knowledge learned, feelings of empowerment, pride, increased self-esteem, and community.

10th Grader, Lee Co., Female:

> Thank you KEMET for helping to prepare me to reach my full potential. KEMET Academy has taught me how to network by forcing me to step out of my comfort zone and reach out to other Scholars and professors. KEMET Academy has connected me to a mentor…who always makes herself available to me. She offers great advice, checks up on my academic achievement and is a positive role model. I have also improved my time management skills since becoming a KEMET Scholar. These skills have truly come in handy because I recently enrolled in a high school with a very rigorous curriculum. I had to put on these skills to keep up with assignments and adhere to my due dates.

Parent of a 10th Grader, Macon Co., Female:

> I [wish] to express my sincere appreciation for Camp KEMET Academy. My daughter has been a KEMET Scholar, since 6th grade and the opportunities afforded her have been awesome. Being a KEMET Scholar has benefited me … in three major ways. Initially, she was given the opportunity to connect with and glean from the expertise and knowledge of outstanding professional black women. This was a major plus for her in that she is an aspiring paediatrician. Seeing and being exposed to black women who possess such knowledge was extremely motivational for her and began to increase her self-confidence as she began to enter junior high school. She received the encouragement and confirmation that she needed to pursue her goals with confidence. Secondly, … I was afforded the opportunity to travel to Connecticut to attend a "Sisters of the Academy Writing Retreat." At this retreat she met professional women aspiring to achieve doctorate degrees. It was then that she was introduced to a professional mentor. Her mentor has continued to check on her for the past three years. Her dedication to … and her academic development has been quite inspiring for me also! Being a young black student from a "Black Belt" county can be somewhat limiting. However, Camp KEMET has allowed her… to go beyond the limits, giving her experiences that her father and I could not have afforded.

10th Grader, Lowndes Co., Female:

> What has KEMET done for me? 1) KEMET has helped me start facing the fear of speaking before people. During my first year at KEMET, we were always confronted with being able to get up and present various projects we created or wrote during class. We also had to present a summary to the parents on the last day. Before being mentored by mentors of KEMET, I was scared to standup before people and speak. Today, I feel more empowered to stand and speak before people. 2) KEMET helps to prepare me for school and college. This past summer KEMET allowed me to go on the Knowledge Bus Tour. This tour helped me to see history in a more real way. I am more prepared in my history class because as we discuss some of the things, people, or places, I can understand it better because I was able to see and learn about the actual site this summer. 3) KEMET also shows me that I can do anything when I put my mind to it. After being around other Scholars, I realize that I have some weaknesses. Well, KEMET [doesn't] allow me to use that as an excuse. The mentors grouped us so that we can learn from the strengths of our teammates.

Overall, students and parents perceived the initiative as beneficial to their personal growth and learning. The longitudinal nature to the program resulted in strong bonds and a sense of community for all involved.

KEMET Competencies Associated with Success for Rural Youth

Scholars continue to find how African American rural students achieve lower average test scores, are less likely to pursue post-secondary education, earn lower wages, inherit less, and transition into higher social strata at lower rates. Over 10 years ago, Phinney and colleagues (1990) identified several factors that promote enhanced competencies in youth living in under-resourced environments or who are at-risk. Positive identity development, greater self-awareness, cultural connectedness, and self-value served as contributors to overall achievement and success of adolescents (Phinney et al, 1990; Seaborn-Thompson and Peebles-Wilkins, 1992; and Bowman and Howard, 1985).

The research team adapted their experiences in facilitating the aforementioned courses to create the KEMET Competencies Associated with Success for Rural Youth (CASRY). These include General Literacy, which involves the ability to read, comprehend, and apply what one has read. The second competency, Computational Skills, involves being able to manipulate numbers, figures, measurements, and apply basic mathematic principles. Analytical Skills, identified as the third competency, includes being able to examine, categorize, and integrate information before and while making decisions or negotiating circumstances. The fourth competence, Computer Literacy, entails having the capacity to utilize computing and other technological advances to manage tasks, challenges, and enhance creativity. Communication Skills, the fifth competency, involves the ability to share thoughts clearly and accurately, including being able to question adults or other people in authority respectfully. Skillfully managing differences with others in a way that results in a positive outcome for all parties concerned is a beneficial skill to possess in social, academic, or employment settings. Lack of this skill contributes to the challenges many youth in this population identify. The sixth competency, Self-Evaluation, is the ability to reflect on one's behavior, contributions, and behavioral strengths or weaknesses. This can result in implementation of new behaviors, skills, functioning, and navigation of challenging environments. The seventh competency, Cultural Literacy, involves being aware of other cultures, practices, and value systems, as well as respecting differences and acknowledging parallels within and between groups. Young people from environments such as the Scholars often live and learn in monolithic environments with little opportunity for exposure to other cultures and groups. Goal Development, the eighth competency, involves having the capacity to: develop viable short-term and long-term goals; identify the steps to reach them; predict possible barriers; and prepare strategies to avoid or overcome those barriers should they present themselves. Values Clarification and Identity, the ninth competency, ensures that young people are aware of issues and values such as working hard, saving money, and respecting others. In order for youth to set realistic goals within the boundaries established by their families, communities, and society, it is important that there is guidance provided regarding the specific expectations from these entities. The tenth competency of Expectations may be interpreted by a parent or other significant adult. This is supported by the eleventh competency of having two or more non-parent invested adults. The concept of investment suggests that adults have a deeper level of concern and intently recognize the

interconnection between success in their lives and the lives of young people to whom they are committed. The twelfth competency is Global Citizenship. Merging of cultures is not only occurring within the boundaries of the United Sates, but across continents. If children are unable to interact with and understand cultures that are different than theirs, their futures will be restricted. The Scholars live in predominantly low-income, racially monolithic, rural communities and attend schools with few economic or human resources. In many of the high schools of these communities, a large majority of students never take a foreign language course. In at least one of the counties represented, a Spanish course is offered via distance learning – not considered one the most effective methods of language instruction. Overall, the parents in these communities don't have resources to provide their children with access to activities exposing them to external communities. Thus, the school environment, extracurricular, and enrichment services are the primary sources of such opportunities. The participants' counterparts in larger Southern city schools are taking Spanish, Japanese, French, Chinese, and German. At many elite schools in other parts of the country, middle and secondary school students are learning the aforementioned languages, as well as Arabic, Asante Twi, Xhosa, and Portuguese. The thirteenth and final competency is Physical and Emotional Health. Participants are members of communities which are overrepresented among those diagnosed with breast, colon and lung cancer; diabetes; asthma and HIV/AIDS. Like the rest of the country, these children also struggle with obesity and poor eating habits. Of the 48 children in KEMET Academy, close to 12% were obese, two were diagnosed with diabetes, and two had asthma. Also, managing emotional health has a great amount of stigma attached to it in rural, southern and African American communities. As a result, we position understanding of emotional and mental health in terms related to eating healthy and monitoring changes in diet, sleep patterns, and the importance of communicating feelings when engaging in these activities (ex. examining reasons behind comfort eating and restless nights). Despite the importance of organized athletics, regular exercise, walking, running, jumping rope, or playing outdoors to maintain normal weight, such activities held little importance to KEMET participants, particularly the girls. Addressing this competency with the others offers a holistic model for the enrichment of under-privileged youth.

The aforementioned enrichment counters the lack of resources available to the program's impoverished population. Incorporating these various competencies promises to offer participants the opportunity to grow academically and personally, potentially moving them beyond the cycle of poverty in which they currently find themselves. Use of the KEMET Competencies Associated with Success for Rural Youth (CASRY) model offers a comprehensive approach to addressing the needs of these at risk youth.

Conclusion

The focus of this model centers upon developing specific skill areas of children from underserved communities. Overall, coupled with opportunities for informal mentorship from individuals that have been successful in educational pursuits, we expect utilization of this model to increase post-secondary preparation and options for rural dwelling African American youth. The model addresses the wholeness of learning in a rural context and has the potential for far reaching influence. Due to preliminary evaluative outcomes of increased student awareness of educational opportunities, career or life options, self-capacity, and motivation, KEMET Academy promises to sustain recurring benefits to the most marginalized rural communities.

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