

“Get Fit”: An Intervention to Improve Health and Fitness Among Urban Youth
Combining *Doing Science* with *Doing Fitness*
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Part 1: Introduction

Obesity rates in the USA are among the highest in the world. Across the nation many children and parents struggle--for a variety of reasons--to eat a healthy diet, exercise regularly, and maintain a healthy weight. The Woodlawn community on Chicago's south side is no exception. Many adults and students do not demonstrate healthy habits (Ng, Fleming, Robinson, Thomson, Graetz, Margono, Gakidou, 2014). Students do not always have health knowledgeable role models when it comes to exercising, eating well, and cleanliness. Early education in health has the highest potential to help students develop appropriately physically and mentally. When students exhibit healthy habits they respond with higher skill achievement than when they follow poor ones. Breakfast consumption during adolescence helps to improve memory and learning ability by increasing the plasma glucose in the brain. Thus students' concentration increases in the class and their academic performance improves (Pollitt & Mathews, 1998). Positive exposure to healthy habits and health-promoting learning experiences will benefit children for the present and their future.

I am proposing starting a health and wellness initiative to get students thinking and moving in an interesting and engaging way. GoNoodle, an online activity, combines the traditional aerobic movement with the fun short physical activity that helps kids realize the effects on the body systems. As students gain a strong academic foundation through a series of scaffolding activities, they will explore the body systems at age appropriate levels. Since many of the students I work with in the Woodlawn community would be considered “at risk”, this program could provide many benefits to their mental and physical well-being. Furthermore, combining the connection of food and fitness in real life instances will intrinsically motivate students to understand how their bodies work. I will use technology in a variety of ways to transform the learning in a rigorous style.

A fitness and wellness initiative requires a strong education in health. Through weekly body systems investigations and laboratories, children will gain knowledge in all the major body systems, and how they work together to promote wellness. For example, we will teach the

supportive and movement roles of the musculoskeletal system. We will also discuss the integrative role of the circulatory system in terms of nutrient and gas delivery to the organ systems. This will all be taught at an age appropriate level. First, and foremost, there will be discussions about food, including choices and caloric content, that will enable children to consider making healthy choices a positive benefit whenever possible. Chicago Public Schools has mandated a health and wellness policy that requires students to collect fitness test data and compare their personal results to national norms. The new health knowledge gained will facilitate student understanding and compliance with the fitness tests. Working in conjunction with the physical education instructor, students will input their data in Google Classroom and create some personal goals based off their data.

As data is collected and recorded students will analyze and interpret the data to answer the question: will regular physical activity improve their overall health. The program would require some basic materials and some technologies that would measure heart rate and body acceleration using monitors and accelerometers. Students would be able to predict the energy expenditure during physical activity. These measurements will help students understand the importance of physical activity and how it relates to BMI and calorie intake. Using Google Classroom students would input data into their personal account to collect throughout each quarter. Students will create personal goals based off their weight and height and calculate their BMI. Once students have the data they can analyze their numbers and form a conclusion. At the end of the school year students will see their growth over the course of one school year. I will create a health webpage to the school site to provide pertinent information for parents and the community to follow the program and participate in some activities, for example, healthy-choices after-school cooking classes may be offered.

Because increasing physical activity is only one part of a healthy lifestyle, we will emphasize the importance of a healthy diet by having students keep a log of their food intake, which will be recorded weekly. Again, health education will include discussion of the body's need for energy, and how excess caloric intake can lead to unhealthy weight gain. With a better understanding of how the body uses food for energy and how important it is for healthy development, students will be empowered to take charge of their own diet. Using Google Classroom the students will receive healthy recipes that can be made with basic inexpensive items they can purchase at Aldi which is right down the street from school. Well-known barriers to a healthy diet cited by students: "Sometimes they [cafeteria personnel] run out of food and they only give the kids toast or cheese toast. They don't have a good back-up supply if they run out of something," and "...I think some of the parents may not want to cook" (Moore, Robinson, Rachel, and Boss, 2013). It is the goal of the project to get young kids to understand the related nature between physical activity, healthy diet and good health.

As a STEM health teacher I will be integrating the disciplines in the appropriate areas. For example, the science of fitness and its relationship to heart rate. Reading and writing is practiced as students complete assignments in Google Classroom. Math will be used when calculating BMI, shopping for ingredients and measuring for recipes.

This is my first year teaching health and using Google Classroom. Chicago Public Schools has recently written a new health and wellness policy that mandates an additional 60 minutes of health instruction weekly, which dovetails with the proposed program. The curriculum available is online through healthteacher.com. Last year I taught science to students and they used Google products to create a digital science fair board rather than the traditional three-sided board. Students should gain good foundational skills that promote healthy habits. Healthy bodies help healthy brains. Students will have access to their own data in Google drive.

Part 2: Literature Review

As an educator in an impoverished area on the southside of Chicago, I believe it is necessary to educate students about the importance of healthy habits. One focus of reviewing the literature is to identify healthy habits in regards to eating nutritionally and participating in the proper amount of physical fitness resulting in overall school engagement, particularly understanding body systems. In addition, it is important to review curricula that have already been developed and implemented to instill healthy eating and exercise habits in adolescents before attempting to design a new intervention.

General overview of the literature

Curriculum that specifically addresses healthy eating habits, the benefits of exercise, and awareness of body composition has not been a regular component of elementary health education. Typically physical education is taught separately from health topics such as nutrition and the science of how the body systems are affected. Surprisingly little research has been focused on the combination of nutritional education and physical fitness education at an elementary school level, and the impact on health. However, studies comparing dietary habits, economic status, academic performance and body mass index indicate that urban children face more barriers to healthy diets and physical fitness than their peers in suburban and rural environments (Moore, Robinson, Rachel, & Boss, 2014). In addition, there is literature that supports changing eating and physical activity habits among adolescent students globally. Other countries are reporting unhealthy habits in adolescent students (Kukulu, Sarvan, Muslu, & Yirmibeşoğlu, 2010).

Rationale

With so many children lacking the knowledge of healthy habits and how it affects the developing body, I feel as an educator it is a problem that needs to be addressed. The research finds that students are not consuming healthy meals and are becoming less active in this ever changing world (Moreno, Denk, Roberts, Tharp, Bost, & Thomson, 2004). My DreamIT project is geared to teach students the importance of eating properly to provide their bodies with the proper nutrients needed as they grow. In addition, students will learn about the body, both the what

(anatomy) and the how (physiology) and the systems involved as they undergo investigations exploring how physical activity directly affects their body. These hands-on and in-depth explorations will facilitate students making connections to their lives and to promotes healthy eating and physical activity as an overall lifetime goal. This literature review informs the design of the new curriculum tailored to the needs and interests of the students.

Adolescent eating habits

Numerous studies have indicated that omitting breakfast interferes with cognition and learning, an effect that is more pronounced in nutritionally at-risk children than in well-nourished children. Breakfast consumption during adolescence helps to improve memory and learning ability by increasing the plasma glucose in the brain. Thus student concentration increases in the class and their academic performance improves (Pollitt, & Mathews, 1998). Nonetheless, breakfast consumption in the United States has declined steadily over the past 26 years for all age groups, and particularly among adolescent girls (Pollitt, & Mathews, 1998). It is important to encourage the general public to eat breakfast. Overcoming the social stigma is essential for increasing participation in US school breakfast programs, as is increasing public awareness of the benefits of breakfast consumption. A study found students may be receiving less than an average of 4 hours of nutrition instruction per year (Carraway-Stage, Hovland, Showers, Díaz, & Duffrin, 2015). This current status of nutritional education for children through adolescents is many years too late when the student reaches high school. The national health standards require students to demonstrate the ability to use decision-making skills, goal-setting skills, and practice health-enhancing behaviors to enhance health.

Access to healthy food choices

Urban areas are often considered “food deserts” as there is very limited access to grocery stores that stock affordably-priced produce. Instead, smaller ‘convenience’-type stores abound, with a wide array of cheap, nutrient-lean/calorie-dense food offerings. The paradox of hunger and obesity in low-income populations, (Block, & Kouba, 2006), was suggested. In women and children, food insecurity is associated with increased prevalence of obesity. Households need to spend available dollars on housing, utilities or health care. This leaves inadequate money for food. Low-cost foods tend to be energy-dense and palatable, with little nutritional content. This relationship is a concern when coupled with lack of knowledge of food consumption and physical inactivity patterns. The absence of a variety of reasonably-priced foods of acceptable nutritional quality can be a barrier to optimal diet patterns. A study that compared dietary habits, economic status, academic performance and body mass index in school children found students living in metropolitan areas consumed more calorie-dense yet nutrient-lean snacks than those living in non-metropolitan areas. This study advocates that school teachers take the lead in receiving training on healthy diets to educate students about proper nutrition and health promoting life long relationship creating a pedagogy to encourage students (Kukulu, et al., 2010).

Adolescent exercise habits

Just as nutrition is key to a healthy mind, physical fitness is an important aspect to help students develop healthy bodies. On average adolescent students are not making healthy choices when it comes to nutrition and physical fitness, often times due to the lack of opportunity (Block & Kouba, 2006). In these early developmental years students need to be knowledgeable about their health and how good health habits now will be rewarding in the future.

There is a lack of research involving physical fitness programs for young children. There are many areas that are hard to control to minimize the various threats of validity. It has been shown that 11 to 13 year olds experience greater barriers in terms of social aspects of physical activity compared to the 9 to 10 year olds. The developmental stage of 11- to 13-year-olds includes identity versus role confusion where there is more emphasis on social interactions. For this sample, those students ages 12 and 13 were held back at some point in their schooling due to possibly illness, late entry into school, or academic difficulties. Further, focus group participants reported that knowledge was a significant barrier to physical fitness. The barriers were categorized into three groups: knowledge, resources and interests. Forty-two percent of respondents included comments relating to knowledge barriers stating that they do not want to go outside because they do not know how to physically play outside. Parents perceive stress and time constraints to be significant barriers to promoting physical activity for their children. Thirty-five percent included comments on resource barriers because they do not live near playground equipment or an efficient area to be physically active. Twenty-two percent made comments that they lacked motivation. Access was the significant barrier to achieving a healthy lifestyle (Moore et al., 2014). The qualitative findings indicated that perceived barriers to physical activity were knowledge related, and the barriers to healthy diet concerned access to healthy foods. The low score could be due to survey questions being misinterpreted, or there was actually fewer barriers than anticipated. However these results are consistent with previous studies conducted with a similar age group of overweight children who had mean total barrier scores at the low range for both Barriers to Physical Activity Scale, as well as the pediatric Barriers to a Healthy Diet Scale. Using a survey of elementary students in Mississippi, qualitatively indicated that perceived barriers to physical activity were knowledge-related, while barriers to healthy diet concerned access to healthy food.

Health focused-interventions

We need more innovative and creative approaches to engage younger children and adolescents' nutritional and physical health in real world applications. There are not many studies that measure both fitness and nutrition knowledge within a curriculum. There are studies with each area of content, nutrition knowledge and fitness knowledge, in isolation of each other. There has not been much research at the elementary level that provides an intervention that includes physical fitness, nutrition and the effects of the body systems. A 12-week program "Be a Fit Kid" has been a positive strategy to improve physical activity and nutritional habits in

children. The physical activity component of the Be a Fit Kid program emphasizes cardiovascular fitness, flexibility, muscular strength, and bone development through running, yoga, jumping, and strength exercises. All activities are individualized and noncompetitive. The nutrition component focuses on current dietary guidelines that emphasize a diet rich in vegetables, fruits, unsaturated fats, and whole grains. Studies have shown that following the 12-week intervention, significant improvements were observed in body composition, fitness, nutrition knowledge, dietary habits, and in those who participated 75% of the time, significant reductions in total cholesterol and triglyceride levels were observed. All the children received the nutrition component of the intervention at the same time. More than 95% of parents of participating children attended an initiation lecture prior to the start of the program that covered nutrition and physical activity principles. Findings from the pilot trial suggest that health promotion programs can be well received by children and may favorably alter overweight and the development of adult lifestyle-related diseases (Slawta, Bentley, Smith, Kelly, Syman-Degler, 2008).

Integrating health content with inquiry science

Additional approaches are needed to supplement existing programs and provide mechanisms to reach students outside of traditional health education settings. One strategy is to teach more health-related topics as part of science classes (Moreno et al., 2004). This inquiry-based hands-on approach augments complex concepts in an exploratory venture that unwraps a deeper understanding by doing. This nontraditional advancement to teaching nutrition-related concepts complemented health instruction by including activities to reinforce concepts aimed at increasing elementary students' science knowledge of energy, metabolism, and nutrition. The hands-on element goes beyond just providing students with the knowledge, it requires application. The application can be synthesized to guide better decision-making and goal-setting skills in healthy behaviors. The field-test group also showed statistically significantly increased understanding of the concepts related to calories as a measure of energy in food, essential nutrients, special dietary needs (e.g., lactose intolerance, type 2 diabetes, and needs of astronauts), basal metabolic rate, recommendations of the Food Pyramid, and the relationship of food consumption to energy exertion.

Unfortunately, K-12 education often places minimal emphasis on what students should know about nutrition upon completion of each grade level. Teaching traditional subject matter, preparing for end of grade testing, growing class sizes, and decreasing funding all contribute to competition for instructional time. Nutrition educators must be creative to address challenges teachers face when teaching nutrition in their classrooms. FoodMaster Intermediate (FMI) is a hands-on, integrative curriculum for children in grades 3-5 that uses food as a tool to teach mathematics and science. As a science-based curriculum, the program uses food as a teaching tool to engage students in integrative learning related to both science and nutrition content. All lessons met at least 1 National Science Education (NSE) standard for grades 3 to 5. In addition to other science standards, FMI specifically aligns to the state-mandated (NSE) content standard Science in Personal and Social Perspectives to integrate science and nutrition

concepts. Within this standard, teachers are expected to provide students with an understanding of their personal health and skill sets that may help them better understand personal and social issues related to health, for example decision-making skills. Researchers hypothesized students exposed to the food-based FMI curriculum would show greater nutrition knowledge at post-intervention compared with children who were not exposed to FMI. The study included 18 fourth-grade classrooms to implement FMI curriculum and 16 fourth-grade classrooms to act as comparison classrooms. Of the participating schools, 16 classrooms were rural and 18 classrooms were urban/suburban. On the basis of enrollment at the beginning of the academic year, the overall rate of usable instruments for the analysis was 72% for the intervention group and 65% for the comparison group. A 28-item multiple-choice questionnaire was used to assess student nutrition knowledge. The intervention group showed significantly higher knowledge in 4 content areas at baseline, and all 6 content areas at post-intervention relative to the comparison group.

Conclusion

In conclusion, urban schoolchildren are often lacking in nutritional education, nutritional availability and opportunities for physical activity. This may lead to lower opportunity for the students to gain knowledge, due to physical limitations, like hunger, or increased illness, due to poor diet. Studies have demonstrated that adolescents' dietary decisions improve with positive modeling and access to foods rich in vitamins and minerals.

About 97% of the students at James Wadsworth STEM qualify for free or reduced breakfast and lunch. Many students do not eat a quality breakfast in the morning. Instead, students can be observed eating flaming hot cheetos and soda. While the free lunch program includes breakfast, some students come to school tardy and breakfast is over. Their next, or first, meal of the day will be a school lunch hours later after many concepts have been covered in the classroom.

Most of the literature that has been reviewed has pointed to the importance of healthy habits in early years for the development of lifelong healthy habits. Students with more knowledge about the effects of a healthy diet and how the body uses food for energy are more likely to make better choices in their daily diets and activity choices. A review of the literature regarding healthy living habits sheds light on the barriers faced and interventions that have been utilized. Students in the Chicago Public Schools are not very active during the day. They are seated for instruction and during their work periods. They have physical education one 60-minute period for the week.

The more knowledge students gain of the effects of calorie-dense foods, or lack of physical activity and nutrient-rich food, on the body systems during primary growth and intellectual development the easier it will be for students to take ownership of what they put on their plate. The intervention design will include Google Classroom to log personal data, fitness scores, and weekly food journals. Specifically, Google forms will be the tool for tracking personal and group progress. Again students will track their physical activity and gain an understanding of how that

activity is affecting the body systems and overall health through hands-on investigations. The Be a Fit Kid program has a good probability of being intrinsically motivating for the population at James Wadsworth STEM School this component will be done in the Physical education class.

This DreamIT proposal is rooted in early intervention and student education of the positive benefits of both a healthy diet and regular exercise. Real-world tools, like application of scientific reasoning and the scientific method, will allow students to define their own best choices for health and wellness, and will foster the use of hands-on data collection in a user-friendly and cross-platform format: Google Classroom. There are significant segments of the adult population in America who lack an accurate understanding of the impact of calorie intake on weight and health, so increasing the knowledge base for children in at-risk populations can be seen as a first-step to a healthy path for life.

Part 3: The Total PACKage

Context

As a first-year K-8 health teacher in an urban STEM school, I have been faced with several obstacles. In previous years, I was a hands-on science lab teacher who was able to engage students with the wonder of the world through scientific inquiry. I had space and wonderful tables that provided me the ability to have students working collaboratively in groups. This year I have very limited workspace in a computer lab. On the bright side, the lab has several three-year-old iMac computers that will allow me to work with the TPACK model to design a health awareness curriculum that engages students using hands-on activities to construct meaning on how the body systems are connected to and are affected by the health choices they make. TPACK is unique in each situation and context. It represents a seamless integration of knowledge within technology, pedagogy, and content that is applied during instruction. The intersection of the three knowledge based areas constitutes a smooth blend including technology knowledge, pedagogy knowledge, and content knowledge for the benefit of learning.



The problem I face is that adolescent students see health as a drab topic. Not as exciting and engaging as the hands-on inquiry they have experienced in the past. The students do not see the connection between the health choices they make and how it affects their bodies. For example many students seem sleepy in class possibly due to not eating breakfast or not getting enough sleep. Students are only participating in the behaviors that they know and see. They have not seen the relevance of how making good choices and participating in healthy habits can change the way they think, feel physically, and feel emotionally.

The curriculum I am required to use this year is online via healthteacher.com. The healthy school initiative adopted by Chicago Public School mandates that students in grades K-8 receive 60 minutes of health instruction per week. Healthteacher is a comprehensive curriculum available to health teachers in CPS. I find it has a lot of paper worksheets to print out for students to complete after a lesson. The existing curriculum is heavily seat work focused, with text to read and worksheets to complete, but not much hands-on learning, and no planned opportunities for physical activity built in.

As the school day goes on students rarely participate in physical activity. Students receive PE class once a week for 60 minutes. Working in conjunction with the PE teacher, physical fitness is currently promoted in health class using 2 or 3 GoNoodle movements. GoNoodle.com is a free site that provides a number of short physical activities, or “brain breaks” that students follow. GoNoodle tracks the amount of time spent doing physical activity. Students are excited to see their classrooms progress compared to other classrooms. While it is true that I am using these activities to get students moving, there is no connection to the science of the body systems that I am proposing, so this will be a tool used for students to investigate pulse before and after the activity. Through guided scientific investigation students will begin to construct an understanding of how different rigorous activity affects the circulatory and respiratory systems. Muscular and bone structure can be integrated into the mini physical activity as students work the different areas of the body. Learning by doing is a more promising way for students to gather their knowledge that will stick for further building. Inquiry based instruction is essential for this student population as many of these students need hands-on experiences of good physically active habits.

Content

To improve the existing curriculum, I propose to design and implement a new, more participatory, hands-on format. Students will explore and more deeply understand connections to key science and health concepts, connections to their lives outside of school, and connections to scientific and evidence-based ways of thinking about food and exercise resulting in knowledgeable decision-making choices everyday about food and exercise. Students will learn the importance of healthy eating, physical activity, and how it is interconnected to the development of their body systems.

The key science and health concepts encompass the basics of nutrition including the recommended daily allowances to promote good food choices. Students will understand how to determine healthy calorie intake and how it is measured. The USDA has some resources on the website for students to gain knowledge of healthy food choices and tracking food intake activity. The fitness section of the intervention in health class will connect the small physical activities to how it affects the body. Working in conjunction with the PE teacher will help students collect their personal data and fitness scores. Students will experience an awareness of how the body is affected as they participate in various levels of aerobic activity and complete mini investigations.

As students build knowledge on nutrition and fitness during health and PE classes and experience inquiry-based hands-on investigations linking the processes of the body systems, students will make connections to their lives outside of school. For example, reaction time experiment using a metric ruler will open discussion of the nervous system. Students will then identify how the two systems muscular and nervous work together. I will then question students about some of their weekend activities that involve the muscular and nervous system resulting in collaboration of various activities they participated in and how both systems work together to provide the coordination for gymnastics, basketball, etc.

With the scaffolding of scientific investigation and evidence students will develop new knowledge that they will build upon to rethink some possible misconceptions. Students' misconceptions of the body systems helps in the design of the inquiry. Before beginning with the body systems students will explore multicellular organisms, such as plants and animals, and identify the various of levels of organization within them. Students will engage in a variety of hands-on activities demonstrating the levels of organization from smallest to largest: Cells-tissues-organs-organ systems-organisms. These hands-on activities include dissection of specimens such as onions and flowers. Identifying different levels of organization through inquiry provides the guided scaffolding as students construct a deeper understanding.

Muscular and skeletal systems connection.

Students will check each other's reflexes by tapping right below the knee cap. Based off their observations they will record the response and compare the muscle movement to time the nervous systems delivery of information happens. The connection has already been introduced with the metric ruler reaction time experiment. Students will make a deeper connection of how the nervous system and the muscular system are working together.

Circulatory and respiratory systems connection.

Another goal of the intervention to get students get past misconceptions they may have about the heart being the mixing place for air and blood. Respiration will also be observed by students using a yeast mini lab. This will allow students to construct understanding of gas exchange as a scaffold to the human blood flow skit. Learners will act out the flow of blood in the human body by participating in a skit that demonstrates gas exchange using 12 inch red plates to represent the blood cell and smaller white plates representing oxygen and small blue plates representing carbon dioxide. The primary function of the respiratory system is to supply the blood with oxygen in order for the blood to deliver oxygen to all parts of the body. Students may think that air is distributed through the body in air tubes. (Air is taken into the body by the lungs. The oxygen in the air passes through the alveoli in the lungs to the blood. The blood takes the oxygen to all the cells of the body). This difficult concept will be practiced in PE during the same weeks using circulatory game which will promote the gas exchange concept while participating in physical activity.

Digestive and Excretory systems connection.

Through a series of activities students construct an understanding of what happens to food when you eat. First students will create a multicolored length of yarn depicting how long the digestive system is using a color for each part the food travels through. Using sugar cubes and loose sugar students will observe what happens when put in water as a model for the absence of mastication. Then students will be given two unsalted soda crackers and asked to chew them for 2 minutes without swallowing. Students will be asked prompting questions on mechanical and chemical changes that occurs during the activity.

Stomach in a cup would help students construct the process food goes through as it is in the stomach. Digestion first breaks down food into smaller nutrient molecules the body can use.

Students will use paper towel and water activity to construct knowledge of how molecules are absorbed into the blood and carried throughout the body through the circulatory system.

The final activity would be creating a digestion simulation including a food tube and food particle as the students narrate the steps of chewing, saliva, stomach pancreatic juices, small intestines (glucose exchange using M&Ms that were buried in the original food particle), large intestines, and rectum/anus as the food particle passes. Finally, wastes are eliminated from the body.

Students may think that if food could not be digested, it would stay in the body and not be eliminated. Young children are typically told that if you swallow gum it will stay in your body for seven years. Teacher will guide inquiry by having students research what happens to gum when swallowed. As a result students will discover gum is recognized as useless by your digestive system and is eliminated within 24-36 hours.

Technology

Technology will be integrated in a couple of different ways. First, students will use Google Classroom where there will be a variety of activities that students will complete. Specifically, students will log personal and fitness data into Google Forms which will be analyzed against the Presidential Fitness Youth Challenge. Students will create a personal goal on what they want to improve in physical activity based off their individual fitness data. They will determine what area needs improvement whether it is sit-and-reach test, pull-up, push-ups, or their pacer score.

Students will research dietary guidelines and explore the five food groups. We will practice creating healthy meals using knowledge gained from researching the food groups. Students will be scaffolded in calorie counting as I model using the calorie tracker on the USDA website.

Student will log calories in Google forms to indicate the amount of daily calories they consume.

Student will be encouraged to input some of the data at home or after school due to limited time in health class. As students begin to uncover what they consume, they begin to be conscious of what they are eating. By providing students with resources to gain knowledge on the importance of nutrition as they grow and develop students are equipped to make better decisions on the food they eat. Based off their data student will analyze of their daily calorie intake including which of the five food groups they come from and set goals if which area should be improved.

Students will engage in the ability to use decision-making skills and goal-setting skills to enhance healthy eating habits.

When considering the body systems, some of the technology used will assist students in understanding the connections between food and fitness. For example, students will use their daily calorie intake measurement and compare the calorie intake versus expenditure using pedometers that calculate calorie burn based on physical activity. Students will walk around the classroom wearing pedometers that calculate calories burned for 60 seconds then do the math on how much walking it would take to burn the calories of a candy bar. Students will investigate concepts with hands-on experiences. I will attach videos to Google Classroom assignments to provide reinforcement explanations of the hands-on activities. A new addition to this intervention will be using some Augmented Reality technology so students will see the heart beating and working lungs when investigating pulse connecting it to the circulatory and respiratory systems. This experience of technology will engage the students in a real visual dimension of how the body organs in systems work.

In order to involve the families, I will create a blog on my school webpage to keep communication open between family and school. This will be a great spot to post healthy recipe ideas, make suggestions on healthy weekend activities, and create health trivia.

Pedagogy

The constructivist approach enhances students' logical and conceptual growth. Through these minds-on-hands-on activities of the intervention design, students will build upon their experiences attaining a deeper understanding of how nutrition and fitness work together and depending on the participation of each area there is an effect on the body. The underlying concept is the role which experiences play in student understanding. Some of these concepts included in my DreamIt are difficult. The learning cycle of the "5 E's" will be used as students construct their own understanding and knowledge of the world through experience and reflection. As students engage, explore, explain, elaborate, and evaluate new patterns of thinking happen. With proper scaffolding, doing, questioning, and collaborating, students will observe, collect data, and analyze information to make decisions and create personal goals.

Inquiry-based activities are engaging for students to think collaboratively as they encounter a void of knowledge. Through guided scaffolding they can investigate to gain knowledge from the new experiences to fill the void. The traditional way of reading and memorizing the way body systems are structured and function has less chance of making real connections and being retained.

The Total PACKage

The weaving of the constructivist approach, minds-on hands-on activities, and technology facilitating the actual doing provides students with the guidance to build a deep understanding of

food and fitness working together. Technology allows the students to gather pertinent information about themselves that provides organization and visuals to analyze. Technology is the tool used to engage students in higher-level thinking. The information they obtain will allow them opportunity to make better health decisions considering their own nutritional and fitness habits. Overtime participating in the hands-on activities and using the constructivist learning strategies students will draw on existing knowledge, beliefs, and skills. With this approach, students synthesize new understanding from prior learning and new information. This intersection of the content knowledge, pedagogy knowledge, and technological knowledge is a sweet spot that is unique from other interventions in where the connection between food and fitness are taught using engaging real life tools including technology. Students will then retest these fitness areas to compare results after 12 weeks of completing health intervention. Constructing an understanding of the connection of food and fitness through inquiry hands-on experiments that explore how the body systems work together is very useful in today's age of obesity and inactivity.

The scaffolding of difficult science concepts using inquiry-based activities allows students to construct meaning through experiences. Augment Reality of the body systems will reinforce some of those difficult concepts that need the visual support. Health concepts incorporated using real-world tools, like application of scientific reasoning and the scientific method, will allow students to define their own best choices for health and wellness.

Part 4: Evaluation Plan

The big goal is for students to apply the acquired knowledge about health and science concepts using this transformational intervention is instilling a new practice based off their personally obtained data to inform decisions about food and exercise. Technology integration is used as a tool to organize and analyze personal data to form conclusions and make better health choices and apply this knowledge to their lives. These concepts will provide life-changing practices that will improve the overall health of our students in urban areas who face more barriers than in other areas.

To measure the impact of the transformative technology intervention on student learning I plan on acquiring information by pretesting the students on particular health and science concepts. The pretest will ask questions that reveal what students know about nutrition and fitness together, including calorie intake versus expenditure. The pretest will also assess students knowledge on the effect of diet and physical activity on body systems and overall health. After the 12-week intervention the students will be reassessed with a post-test. The post-test will provide a quantitative measure of what knowledge students gained. This tool will provide me with specific areas that were successful in the intervention and possible areas to improve.

Another type of quantitative measure is student attendance, which will be documented daily. This information will be compared with daily attendance data 12 weeks before and 12 after the

intervention. This indicator will help determine if the intervention of the awareness on healthier habits made a difference in the student's actual health, assuming that an absence is due to sickness. If students are doing a better job at applying healthier practices they would live healthier lives which would result in less absences. Their grades for reading and science will be pulled from the gradebook at the beginning of the 12-week intervention and then again at the end of the 12-week intervention. This information will be useful to review to see if there were any changes of academic performance. In this case, the science grade may be impacted by the intervention curriculum, so the reading grade is used as a control.

Consent forms and Assent forms will be used to properly inform the children and their parents about the study and what is expected to occur. Also, the collection of data, like IBM and food diet information, may be personal information, and proper documentation is appropriate. This data will be logged in Google Classroom by the students themselves who will evaluate their own fitness ability and eating habits to assist in personal goal-setting statements. The one area of fitness each student chooses at the beginning of the intervention as a goal to improve will be retested to determine if there is improvement. The students' BMI would be recalculated after the 12 weeks to discover if there was change. Again at the end of the year students will re-check their BMI and compare it to a group of student averages that did not receive the intervention. The students' food logs would also be evaluated before and after the intervention to deduce whether there was a change in nutrition, and in dietary choices made by the students.

The qualitative approach will occur through direct observation of participants as students engage in inquiry-based, hands-on activities using a variety of technologies. With careful day-to-day note taking during the implementation of the intervention the teacher will be able to determine whether students are constructing new information and connecting it to their ability to make better decisions in their personal lives. The information gathered by the teacher through observation of student performance will be processed so that there can be a determination on the success of the students change in healthy habits. The teacher notes will help make specific adjustments and improvements where applicable.

Even though there are several layers to the evaluation of the transformational integration of technologies intervention, the plan is specific. The clarity of the plan will generate empirical evidence to answer whether this intervention improved student capacities for using self-collected information to inspire healthy personal decisions based from new knowledge of nutrition, fitness, and how both have effects on the body systems. As students do the science with the fitness creating deeper understanding of these concepts, and how they connect it into their lives, change should happen as students begin to take charge of their own quality of health.

References and Annotated Bibliography

Block, D., & Kouba, J. (2006). A comparison of the availability and affordability of a market basket in two communities in the Chicago area. *Public health nutrition*, 9(07), 837-845.

Carraway-Stage, V., Hovland, J., Showers, C., Díaz, S., & Duffrin, M. W. (2015). Food-based science curriculum yields gains in nutrition knowledge. *Journal of School Health*, 85(4), 231-240. Retrieved from <http://ezproxy.msu.edu.proxy2.cl.msu.edu/login?url=http://search.proquest.com.proxy2.cl.msu.edu/docview/1697486805?accountid=12598>

Garton, S. (1977). Nutrition and body systems in the elementary school. *Illinois Teacher of Home Economics*, 20(3), 126-130. Retrieved from <http://interlib.lib.msu.edu/illiad.dll?Action=10&Form=75&Value=910055>

Komro, K. A., Flay, B. R., Biglan, A., & Promise Neighborhoods Research Consortium. (2011). Creating nurturing environments: A science-based framework for promoting child health and development within high-poverty neighborhoods. *Clinical child and family psychology review*, 14(2), 111-134.

Kukulu, K., Sarvan, S., Muslu, L., & Yirmibeşoğlu, Ş. G. (2010). Dietary habits, economic status, academic performance and body mass index in school children: a comparative study. *Journal of Child Health Care*, 14(4), 355-366.

Moore, M. M., Robinson, J. C., Rachel, M. M., & Boss, B. J. (2014). Barriers to Physical Activity and Healthy Diet Among Children Ages 6 Through 13 in a Mississippi Elementary School. *Journal of pediatric nursing*, 29(1), 74-82.

Moreno, N. P., Denk, J. P., Roberts, J. K., Tharp, B. Z., Bost, M., & Thomson, W. A. (2004). An Approach to Improving Science Knowledge About Energy Balance and Nutrition Among Elementary- and Middle-School Students. *Cell Biology Education*, 3(2), 122-130. <http://doi.org.proxy2.cl.msu.edu/10.1187/cbe.03-08-0008>

Ng, M., Fleming, T., Robinson, M., Thomson, B., Graetz, N., Margono, C., . . . Gakidou, E. (2014). Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: A systematic analysis for the global burden of disease study 2013. *The Lancet*, 384(9945), 766-81. doi:[http://dx.doi.org.proxy1.cl.msu.edu/10.1016/S0140-6736\(14\)60460-8](http://dx.doi.org.proxy1.cl.msu.edu/10.1016/S0140-6736(14)60460-8)

Pollitt, E., & Mathews, R. (1998). Breakfast and cognition: an integrative summary. *The American journal of clinical nutrition*, 67(4), 804S-813S.

Slawta J., Bentley J., Smith J., Kelly J., Syman-Degler L., Promoting Healthy Lifestyles in Children: A Pilot Program of Be a Fit Kid, Health Promotion Practice July 2008 vol. 9no. 3 305-312

Wood, L., Ivery, P., Donovan, R., & Lambin, E. (2013). "To the beat of a different drum": Improving the social and mental wellbeing of at-risk young people through drumming. *Journal of Public Mental Health*, 12(2), 70-79.

Block, D., & Kouba, J. (2006). A comparison of the availability and affordability of a market basket in two communities in the Chicago area. *Public health nutrition*, 9(07), 837-845.

This study of food quality and availability was conducted comparing two different Chicago communities that border each other: Oak Park, which is a middle-to-upper class suburban area, and Austin, which is working-class, predominantly African American area on Chicago's west side. The paradox of hunger and obesity in low-income populations was suggested. In women and children, food insecurity is associated with increased prevalence of obesity. Households need to spend available dollars on housing, utilities or health care. This leaves inadequate money for food. Low-cost foods tend to be energy-dense and palatable. This relationship is a concern when coupled with knowledge of food consumption and physical inactivity patterns. The absence of a variety of reasonably priced foods of acceptable quality can be a barrier to optimal diet patterns. This study highlights the need to consider community food systems as another contributor to food insecurity. The ability of households to obtain foods contributes to optimal dietary patterns and the role that food systems may play in negative health outcomes such as obesity. While chain supermarkets and super centres may be adequate for areas with high automobile access, in areas with lower access, a diversified store mix could be beneficial. Poor quality produce occurred only in two store types: independent groceries and liquor stores. All stores selling poor produce were in Austin. If Austin residents had to rely only on grocery stores in the neighbourhood surrounding their homes, obtaining a wide variety of acceptable quality foods for an optimal diet would be difficult.

Carraway-Stage, V., Hovland, J., Showers, C., Díaz, S., & Duffrin, M. W. (2015). Food-based science curriculum yields gains in nutrition knowledge. *Journal of School Health*, 85(4), 231-240. Retrieved from <http://ezproxy.msu.edu.proxy2.cl.msu.edu/login?url=http://search.proquest.com.proxy2.cl.msu.edu/docview/1697486805?accountid=12598>

This study found students may be receiving less than an average of 4 hours of nutrition instruction per year. Integrating nutrition with other subject areas such as science may increase exposure to nutrition education, while supporting existing academics. During the 2009-2010 school year, researchers implemented the Food, Math, and Science Teaching Enhancement Resource (FoodMASTER) Intermediate (FMI) curriculum in 18 fourth-grade classrooms,

whereas 16 classrooms served as comparison. FMI is a hands-on, integrative curriculum for children in grades 3-5 that uses food as a tool to teach mathematics and science. Researchers developed a 28-item multiple-choice questionnaire to assess students' nutrition knowledge in 6 content areas. Students were evaluated at baseline and post-intervention. Data were analyzed using independent t tests. Analysis of covariance was employed to control for differences at baseline when assessing the effectiveness of the FMI curriculum to increase nutrition knowledge. A significant improvement was observed in total nutrition knowledge at post-intervention and in all content areas post-intervention. Findings from this study suggest teachers were successfully able to integrate science and nutrition to meet multiple academic standards. More specifically, results showed implementation of the integrative FMI curriculum effectively improved fourth-graders' nutrition knowledge compared with students not exposed to FMI.

Garton, S. (1977). Nutrition and body systems in the elementary school. *Illinois Teacher of Home Economics*, 20(3), 126-130. Retrieved from <http://interlib.lib.msu.edu/illiad.dll?Action=10&Form=75&Value=910055>

This intervention was developed by a school nurse in response to the "Critical Health Problems and Comprehensive Health Act" which became Illinois law in 1971. This law called for a sequential health education program for grades K-12. The organizing framework for the intervention was based off the body systems at age appropriate levels. This does not mean that that body structure and function were the primary concern. Rather the systems approach provided a unifying framework that gives a more wholesome view to health topics. This provided the students continuity and connections at the various grade level to have real life experiences to connect through application for better engagement. For example in the second grade skin and the five senses are integrated with simple experiments that lead to discussion about bacteria and the practice of first aid. The five senses included looking at their contribution to food enjoyment.

At the fourth grade level, digestion is integrated as students learn about nutrition and how food breaks down. A small analogy with a flashlight and battery helps student understanding. The flashlight representing the body and the batteries are representing the nutrients. What happens to the flashlight energy when there is not enough, just the right, or too much nutrients. The eighth grade level focused on the progresses from the nervous system as a physical structure to its relationship to mental and emotional health, drug use and abuse, sexual growth and responsibility. The nutritional component gave attention to fifteen common specific nutrients that were identified and scaffolded starting in second grade to 8th for deeper understanding. Overall the intervention have been engaging. The interest, in both nutrition and health, has exceeded the expectation. The approach is a great way to make nutritional education a meaningful experience.

Komro, K. A., Flay, B. R., Biglan, A., & Promise Neighborhoods Research Consortium. (2011). Creating nurturing environments: A science-based framework for promoting child health and development within high-poverty neighborhoods. *Clinical child and family psychology review*, 14(2), 111-134.

The Promise Neighborhoods initiative is an ambitious effort to address intergenerational poverty and promote child educational and health outcomes. Its model is the Harlem Children's Zone where a community-based organization works to support the quality of life by providing support in distressed areas. The Framework for creating a nurturing environment includes distal influences, proximal influences, and primary outcomes. Therefore community-wide efforts integrating strategies to improve the social and physical environments within families, schools, peer groups, and neighborhoods are vital in promoting optimal child health and wellbeing. This designed framework is an effort to improve child outcomes and reduce health and educational inequalities. Integrating knowledge of potent and malleable influences and effective strategies into regular ongoing community based practice, along with promotion and assistance in the use of scientific methods for continuous quality improvement and analysis of results, are key to determining what is and what is not working to improve the wellbeing of the children. This newly proposed initiative by President Obama sets up scientifically sound parameters for measurement when creating the design phase. Key implications of the Creating Nurturing Environments framework include the following: 1. Cognitive, social-emotional, psychological, behavioral, and health outcomes have inherent interrelationships. 2. The framework warrants a developmental perspective and multiyear efforts, given the significance and long-lasting effects of influences during earlier phases on later phases of development. 3. The framework includes comprehensive multicomponent and multilevel strategies, considering the interrelatedness of outcomes and interactions among influences. They are now developing an infrastructure to support standardized collection of data and a summary of results for neighborhoods to use in achieving continuous quality improvement and to construct rigorous evaluations of each intervention component and an overall evaluation of multicomponent, community-wide initiatives. The main focus was to present (1) a science-based framework that defines a key set of child and adolescent developmental outcomes and (2) a comprehensive intervention template to increase nurturing environments that could affect those key outcomes. The ultimate goal is to use the framework as a guide to promote effective and lasting improvements in social and physical environments that result in optimal child outcomes and break the cycle of intergenerational poverty.

Kukulu, K., Sarvan, S., Muslu, L., & Yirmibeşoğlu, Ş. G. (2010). Dietary habits, economic status, academic performance and body mass index in school children: A comparative study. *Journal of Child Health Care*, 14(4), 355-366.

This study involved comparing 737 students in grades 6th-8th dietary habits, economic status, academic performance and body mass index. Turkish people are at risk of obesity after discovering the existence of fast food as a way of Western lifestyle initially through media. The study compared dietary habits of students in metropolitan and nonmetropolitan areas.

Traditionally, many families purchase fresh food on a daily basis at local markets and prefer the Mediterranean type of diet. As school populations grow and budgets shrink, schools give higher priority to building classrooms than expanding their food service facilities which often are inadequate in terms of preparing and serving appealing meals to the students. Questionnaires were given in the classrooms where much of the data was collected. The students living in a metropolitan area had similar income levels just as the students from non metropolitan area. Obesity was found to be more prevalent to students living in metropolitan areas with smaller family size. Students that live in the non metropolitan area were more likely to eat breakfast and lunch at home. Obesity was not related to the education level of the parents. Students living in the metropolitan areas consumed more snacks than those living in non-metropolitan areas. This study advocates that school teachers be a special group that should receive training on healthy diets to educate students about proper nutrition and health promoting life long relationship. So globally there are trends of lack of movement and poor nutrition resulting in obesity among children.

Moore, M. M., Robinson, J. C., Rachel, M. M., & Boss, B. J. (2014). Barriers to Physical Activity and Healthy Diet Among Children Ages 6 Through 13 in a Mississippi Elementary School. *Journal of pediatric nursing*, 29(1), 74-82.

The purpose of this study was to identify the perceived barriers to a healthy lifestyle in terms of physical fitness and healthy diet among students ages 6-13 in one inner-city Mississippi school. The method included the Pender's Health Promotion Model which provided the theoretical framework for the study. The Barriers to Physical Activity Scale was the instrument used to measure the perceived barriers to engaging in physical fitness. The Pediatric Barriers to a Healthy Diet Scale was used to measure the student's level of perceived barriers to a healthy diet. The qualitative results revealed that adult stakeholders mention perceived barriers to physical fitness in terms of knowledge, resources, and interest. The focus group participants expressed that access/availability, knowledge, and desire related to healthy food choices were significant concerns in terms of barriers to a healthy diet. In conclusion the population of 11 to 13 year olds experience greater barriers in terms of social aspects of physical activity compared to the 9 to 10 year olds. This could be due to the adolescent development of identity placing a greater importance on social interactions. Further, focus group participants reported that knowledge was a significant barrier to physical fitness and access was the significant barrier to achieving a healthy diet.

Moreno, N. P., Denk, J. P., Roberts, J. K., Tharp, B. Z., Bost, M., & Thomson, W. A. (2004). An Approach to Improving Science Knowledge About Energy Balance and Nutrition Among Elementary- and Middle-School Students. *Cell Biology Education*, 3(2), 122–130. <http://doi.org.proxy2.cl.msu.edu/10.1187/cbe.03-08-0008>

In response to the identified need for supplementary approaches to teaching nutrition-related concepts, scientists and educators at Baylor College of Medicine (BCM) recently developed an interdisciplinary instructional unit aimed at increasing elementary and middle school students'

science knowledge of energy, metabolism and nutrition. Entitled “Food and Fitness”, the unit is designed to complement health instruction in schools by providing activities that can be taught as part of upper elementary- and middle-school science classes. The activities in Food and Fitness address Science as Inquiry, Life Science, and Physical Science content standards outlined in the NSES. Food and Fitness allows students to explore basic concepts, such as energy in living systems, metabolism, and nutrients, while building knowledge about diet, exercise, and health. The field-test student group, which initially demonstrated very limited knowledge of many concepts on the pre-assessment, performed dramatically better related to portion size, products of respiration, energy in foods, and the meaning of “diet.” The field-test group also showed statistically significantly increased understanding of the concepts related to calories as a measure of energy in food, essential nutrients, special dietary needs (e.g., lactose intolerance, type 2 diabetes, and needs of astronauts), basal metabolic rate, recommendations of the Food Pyramid, and the relationship of food consumption to energy exertion.

Ng, M., Fleming, T., Robinson, M., Thomson, B., Graetz, N., Margono, C., . . . Gakidou, E. (2014). Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: A systematic analysis for the global burden of disease study 2013. *The Lancet*, 384(9945), 766-81.

doi:[http://dx.doi.org.proxy1.cl.msu.edu/10.1016/S0140-6736\(14\)60460-8](http://dx.doi.org.proxy1.cl.msu.edu/10.1016/S0140-6736(14)60460-8)

In 2010, overweight and obesity were estimated to cause 3-4 million deaths worldwide. The rise in obesity has led to widespread calls for regular monitoring of changes in overweight and obesity prevalence in all populations. Comparable, up-to-date information about levels and trends is essential to quantify population health effects and to prompt decision makers to prioritise action. We estimate the global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013. The method identified surveys, reports, and published studies (n=1769) that included data for height and weight, both through physical measurements and self-reports. In the study mixed effects linear regression was used to correct for bias in self-reports. We obtained data for prevalence of obesity and overweight by age, sex, country, and year (n=19 244) with a space-time process regression model to estimate prevalence with 95% uncertainty intervals. The worldwide findings showed an increase in proportion of adults with (BMI) in both men and women between 1980 and 2013. Prevalence has increased substantially in children and adolescents in developed countries; 23·8% of boys and 22·6% of girls were overweight or obese in 2013. The prevalence of overweight and obesity has also increased in children and adolescents in developing countries, from 8·1% to 12·9% in 2013 for boys and from 8·4% to 13·4% in girls. Because of the established health risks and substantial increases in prevalence, obesity has become a major global health challenge. Not only is obesity increasing, but no national success stories have been reported in the past 33 years. Urgent global action and leadership is needed to help countries to more effectively intervene.

Pollitt, E., & Mathews, R. (1998). Breakfast and cognition: an integrative summary. *The American journal of clinical nutrition*, 67(4), 804S-813S.

This summary is based off papers presented at the International Symposium on Breakfast and Performance in Napa, CA that were summarized by Mathews (1) in 1996, 1 y after the publication of a review by Pollitt (2) on breakfast research as it relates to children and school performance. The data suggest that children perform certain tasks of cognition (eg, working memory) more successfully after eating breakfast after fasting overnight. Theoretically, there are two plausible biological mechanisms by which breakfast may affect brain function and cognitive test performance. One involves metabolic changes associated with an extended overnight fast to maintain the availability of fuel and other nutrients to the central nervous system. The other involves the long-term salutary changes that breakfast may have on nutrient intake and nutritional status, which in turn could affect cognition. No robust conclusions can be drawn from the existing data on either the long- and short-term benefits of breakfast on cognition and school learning or the mechanisms that mediate this relation. Significant gaps remain as to how age, sex, nutritional status (past and current), and the timing, size, and composition of the morning meal modify these effects. The pooled data suggest that omitting breakfast interferes with cognition and learning, an effect that is more pronounced in nutritionally at-risk children than in well-nourished children. Breakfast consumption during adolescence helps to improve memory and learning ability by increasing the plasma glucose in the brain. Thus student concentration increases in the class and their academic performance improves. Nonetheless, breakfast consumption in the United States has declined steadily over the past 26 years for all age groups, and particularly among adolescent girls. It is important to encourage the general public to eat breakfast. Overcoming the social stigma is essential for increasing participation in US school breakfast programs, as is increasing public awareness of the benefits of breakfast consumption.

Slawta J., Bentley J., Smith J., Kelly J., Syman-Degler L., Promoting Healthy Lifestyles in Children: A Pilot Program of Be a Fit Kid, *Health Promotion Practice* July 2008 vol. 9no. 3 305-312

The purpose of this article is to describe the Be A Fit Kid pilot intervention and offer suggestions for ways in which universities and communities can work together to implement innovative and successful health promotion programs in elementary schools. The physical activity component of the program emphasized cardiovascular fitness, flexibility, muscular strength, and bone development through running, jumping, yoga, and strength exercises. The nutritional aspect of the Be A Fit Kid intervention followed the physical activity component and focused on current dietary guidelines that emphasize a diet rich in vegetables, fruits, unsaturated fats, and whole grains, and low in saturated fat and sugar. All the children received the nutrition component of the intervention at the same time. Parent involvement. More than 95% of parents of participating children attended an initiation lecture prior to the start of the program that covered nutrition and physical activity principles. Several programs across the country have introduced heart-health education into the elementary school classroom curriculum and have increased physical activity

in children. The Child and Adolescent Trial for Cardiovascular Health and the Heart Smart Cardiovascular School Health Promotion Program addressed large numbers of elementary schoolchildren over a few years with a multicomponent approach by including nutrition education, physical fitness activities, heart-healthy cafeteria choices, school staff training, and parent education.

Wood, L., Ivery, P., Donovan, R., & Lambin, E. (2013). "To the beat of a different drum": Improving the social and mental wellbeing of at-risk young people through drumming. *Journal of Public Mental Health*, 12(2), 70-79.

This study promotes an intervention which seeks to influence decisions and behavior in the future. Participation in the arts may have a more immediate or concurrent impact on mental or social well being. Drum circles have been used as healing ritual in many cultures worldwide and is the contemporary therapeutic strategy. It has been described as having a calming influence and a stress reliever. Most drumming studies have been done with adults very few with children and adolescents. Australia conducted a DRUM BEAT program over a course of ten weeks. The program incorporated theme such as self-expression, communication, peer pressure, bullying, tolerating diversity. The first small scale evaluation was originally developed including 30 intervention and 30 control group with a pre-and post measure of self-esteem and attendance. To further investigate the effectiveness a larger scale with a total of 19 schools (primary n=10, secondary n=5, ELA n=4) were included. Students from ages nine to 27 with high-risk backgrounds for a total of 180 participants. All participants completed the Rosenberg self-esteem scale prior to commencement and again at the end of the ten weeks 150 finished of the initial 180. Of the 19 participating schools 15 provided information related to attendance and behaviour incidents. Overall the average self esteem score increased by 10%, behavior incidence were significantly less, absences were less during the duration of the program. A positive sense of community with pride and belonging improved through cooperation and interaction during the program.

