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Youth Participatory Action Research and Diet Decolonization to Improve Student Learning and Community Health: a Literature Review

Lyle S. Dandridge Jr.
Bethel University

YOUTH PARTICIPATORY ACTION RESEARCH AND DIET DECOLONIZATION TO IMPROVE STUDENT LEARNING AND COMMUNITY HEALTH: A LITERATURE REVIEW

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LYLE S DANDRIDGE JR

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LYLE S DANDRIDGE JR.

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Advisor's Name: Steven Kaatz, PhD

Program Director's Name: Molly Wickam, PhD

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> "It is better to oppose the forces that would drive me to self-murder than to endure them. Although I risk the likelihood of death, there is at least the possibility, if not the probability, of changing intolerable conditions…Revolutionary suicide does not mean that I and my comrades have a death wish; it means just the opposite. We have such a strong desire to live with hope and human dignity that existence without them is impossible. When reactionary forces crush us, we move against these forces, even at the risk of death" (Newton, 2009, p xiv).

Abstract

The present study reviews the current literature related to culturally relevant nutrition education and its applicability to student learning within a secondary school setting. Specifically, this study examines how a youth participatory action research (YPAR) framework can be used to introduce students to the *Diet Decolonization* concept. In tandem, these ideals seek to improve student nutrition through evidence-based instruction, while also remaining sensitive to students' diverse backgrounds. A tentative YPAR research design is offered, as well as recommendations for researchers to avoid bias and promote reflective thought prior to embarking on this type of research.

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CHAPTER I: INTRODUCTION

Reason for Study

As a life science instructor, my purpose for teaching is to make quality science instruction available to diverse, inner-city students. More importantly, my intent is to do so while being cognizant of the pitfalls commonly associated with making science education an inequitable practice. For instance, traditional science instruction is often regarded as marginalizing to various peoples falling outside the narrow "White, middle-class, male" subset (Aikenhead, 2006, Baptista & El-Hani, 2009). This is due, in part, to the presentation of science as a body of facts, compiled by wealthy-elite class White men over many centuries, through the use of a specific set of practices (Aikenhead, 2006). This overlooks the fact that science, as the practice of observing and solving problems in the world around us, is a basic human endeavor that has allowed humans to survive and thrive since our initial existence as a species (NGSS Lead States, 2013). Similarly, this viewpoint lends no credence to the fact that many great scientific discoveries have been made rather haphazardly (Kohn, 1989), or that science is more appropriately regarded as a tentative collection of frequently changing ideas given new evidence (Adedoyin & Bello, 2017). Armed with this understanding, I seek to teach science in a way that acknowledges the many contributions of diverse populations over time, and also makes room for new culturally-inspired inputs.

This past school year I was charged with developing a new college credit course for high school students that covers nutrition and fitness topics. My hope was that by choosing a discussion format, rather than direct-instruction, I would be more informed about *how* my students were processing the health and nutrition information we explore. I also structured the

course with an emphasis on using new information to generate novel questions, rather than promoting passive acceptance of information as a learning endpoint. Both of the aforementioned moves were intended to promote a *dialogue* about health between students and textual information, rather than an authoritative *monologue* where students learn a particular view about what counts as healthy. During the course, students were prompted to do multiple reflections on how their growing scientific knowledge about nutrition and health informs their lives. What I began to notice was that students overwhelmingly concluded that their cultural eating patterns were quite unhealthy. This informed me that my students felt forced to choose between embracing health or embracing their (Hmong/Somali/Karen/etc.) heritage.

For me, this meant that despite my best efforts, I still somehow managed to do that which I set out to avoid initially. By distancing my students from science learning based on their distinct cultures, I was essentially marginalizing them. After speaking with some fellow social justice educators, I became aware of a Diet Decolonization movement springing up in multiple places around the country. The philosophy behind the movement centers on viewing decolonizing as:

> the ongoing process to end oppression and servitude and to restore respect for indigenous knowledge and ways of life…Decolonization means reclaiming and honoring our histories, our stories, and our traditions as a way to fight for our common humanity. (Esquibel & Calvo, 2017, para. 4)

Decolonizing is an integral process within the post-colonialism branch of social justice, wherein peoples who have been impacted by historical, imperialist influence attempt to revisit

the pre-imperialist, traditional practices held by their people. In the present example, *Diet Decolonization* is about helping various cultural groups affected by U.S. imperialism to reclaim more historically accurate (culturally speaking) diets that are typically healthier than what those cultural diets looks like by contemporary standards (Esquibel & Calvo, 2013). In general, decolonized diets tend to be more plant-derived, and structured around consumption of complex carbohydrates, as opposed to enriched, highly-processed and refined carbohydrates standard in typical U.S. diets. For example, the typical Mexican-American diet involves dishes with lots of processed foods and saturated fats obtained from fried beans and tortillas, heavy creams, and lots of charred meats. However, a decolonized Mexican-American diet is highly plant-based, with an emphasis on non-fried beans and tortillas, corns, squash and other vegetables.

The present research aims to locate and synthesize existing scientific literature towards informing the development of a nutrition curriculum that introduces students to the decolonized diet movement. Although the course taught is titled *Nutrition and Fitness*, only two of fourteen chapters are dedicated to fitness, and thus this investigation focuses primarily on the nutritional aspect of the curriculum. This curriculum should help bridge the observed gap between students growing knowledge about nutrition and health, and the cultural eating practices they consider integral to their identities. This curriculum is foundational to a future study that draws on youth participatory action research (YPAR) as a framework for leading students towards learning and combating the colonization of their cultural diets.

Definition of Terms

For the sake of clarity, and to facilitate full engagement with the present study, some frequently used words and concept need to be operationalized. Below is a list of those terms with accompanying discussion.

Culture – Merriam-Webster defines culture both as "the customary beliefs, social forms, and material traits of a racial, religious, or social group; the characteristic features of everyday existence shared by people in a place or time" and also "the set of values, conventions, or social practices associated with a particular field, activity or societal characteristic" ("culture", 2017, para. 5). These definitions indicate the salience of context while discussing culture, as it relates not just to people, but also places and things. Culture is intersectional, existing in the same way that people do, not confined within a single specific niche but rather most accurately represented by the intersection of all their various identities. For instance, a Black, female lawyer who is a lesbian participates in *Black*, *female*, *professional* (lawyer), and *homosexual* (LGBTQ+) cultures to varying degrees, within her daily existence. As a lawyer, she is also likely enmeshed in upper class culture. These various cultural identities may blend smoothly or conflict greatly at any given time, but this is the nature of intersectionality, and by extension, the nature of culture. When culture is referenced in the present study, it is in observance of this intersectionality but with primary regard for the traditional practices and customs as defined at the ethnic group level. This constraint is intended to facilitate student's ability to self-identify and incorporate a decolonized diet most appropriate for them.

Diet Decolonization – Post-colonialism is a theoretical approach that provides a Critical analysis of the ways colonizing entities (by physical presence or ideologically speaking) leave lasting impressions on native or displaced populations, even after the colonizing group may have been removed or had their actual physical presence severely diminished. Recently, post-colonialism has shown up in the context of nutrition and human diets as a movement labeled *diet decolonization*. In this framework, populations analyze how their cultural diets have shifted due to various colonizing forces (i.e. typically Western influence) and try to reclaim diets more reminiscent of pre-colonial influence (Esquibel & Calvo, 2017).

Embracing diet decolonization requires some ethnographic research in order to accurately identify change in food patterns of specific populations over time and is necessary to determine or speculate about the causes for said change. For example, many African-Americans eat cultural diets that revolve around *soul food* meal options, which arose from the food preparation techniques African slaves used to make leftover and/or otherwise undesirable foods allotted them by slave owners, more palatable (African American Registry, 1492). Many of these foods are fried, typically in hydrogenated oils, and contribute to obesity and hypertension in the African-American population. A decolonized African-American diet, however, might resemble more of a West-African diet, which is low fat, high fiber, and is primarily plant-based (beans, cornmeal, leafy greens) with less meat at any given meal (Salifou, 2013). The switch to a decolonized diet for African-Americans has been shown to positively influence health markers in individuals after only two weeks (O'Keefe et al., 2015). These findings suggest diet decolonization should be included in a comprehensive nutrition and fitness curriculum.

Marginalize – This term refers to the relegation of individuals or groups toward the outer fringe of individual or societal concern and/or access to advantages/opportunities. It is a similar term to ostracize, disadvantage, and disenfranchise. In the present study, this idea primarily relates to the continued depiction of science, a basic human endeavor, from one specific lens described elsewhere as Western Modern Science (WMS). This narrow view of science is regarded as a primary driver behind the marginalization of students, which contributes to the lack of diversity in science majors and careers (Aikenhead, 2006; Baptista & El, Hani, 2009).

Social justice in science education (SJSE) – SJSE is a comprehensive approach to science instruction oriented towards the acquisition and incorporation of students' diverse perspectives into the science curriculum they experience. This approach is characterized by pedagogy that can be described as either relational (i.e. improving how students relate to the teacher, each other, and the world around them) (Emdin 2011; Calabrese-Barton & Osborne, 2001), or transformational (i.e. focusing on how information can be used to improve the world around them) (Hodson, 2003; Zembylas, 2005).

(Y)PAR – Participatory action research (PAR) and youth participatory action research (YPAR) both arose from a desire to shift general research mentality from doing research "on" adults and youth, to doing research "with" them (Torre & Fine, 2006). This can be thought of more simply as giving all research stakeholders (e.g. community members, participants, etc.) more equitable representation and decision-making power regarding the focus, implementation, analysis, and dissemination of research findings. In the present study, this philosophy will guide

both the ongoing development of nutritional curriculum, as well as the research into how diet decolonization might look for the various ethnic groups that comprise my student population.

Thesis Question

How does scientific research suggest knowledge of decolonizing diets in conjunction with YPAR might affect high school students' understanding of the relationship between healthy eating and their cultural food practices?

Summary

In this section, I discussed using a systematic literature review to inform the development of curriculum for my nutrition and fitness class, as the purpose of this study. This curriculum will blend nutrition and health information with awareness of the diet decolonization movement, using youth participatory action research methodology. The intersection of these paradigms should result in a curriculum that is more culturally responsive than previous iterations. This curriculum will later be used in a future study to determine how a culturally responsive nutrition curriculum impacts student learning.

CHAPTER II: LITERATURE REVIEW

Cultural Relevance and Nutrition Education

This chapter highlights connections among scientific literature on social justice in education, nutritional education, and youth participatory action research. First, the search criteria used to locate relevant literature is outlined. Next, documented instances of cultural conflicts between students and the culture of science commonly observed in formal learning settings are described. Third, literature on social justice in science education is presented. Fourth, nutrition education literature and its relevance to the present study is evaluated. Lastly, youth participatory action research conducted in a nutritional context is discussed.

Search Parameters

The vast majority of literature utilized in the present study was found using the OneSearch search engine in January of 2017. Various keyword and subject term combinations were used within the electronic database, including: “science education,” “social justice pedagogy,” “social justice teaching,” “participatory action research,” “youth participatory action research,” “nutrition education,” and “social justice.” Further resources were located by combing the reference lists of relevant articles found through OneSearch. Some scholarly works were identified prior to the search through previous readings, course assignments, and/or recommendations, such as: *National Science Education Standards*; *Scope, Sequence, and Coordination of Secondary School Science*; *Science Education for Everyday Life*, *Other People’s Children*, and *Deep Knowledge: Learning to Teach Science for Understanding and Equity*.

Cultural Conflicts Between Students and Science

Cross-cultural clashes between the cultures of school science and students' diverse cultural backgrounds has been well-documented in the literature (Kumashiro, 2001; Lee & Luykx, 2007; Osborne & Calabrese-Barton, 1998). To be more specific, the burden of these conflicts fall primarily on the backs of students of color (SOCs), as evidenced by existing differences in NAEP science scores between SOC and White students (National Center for Education Statistics, 2015). Even for Asian students who perform on par with or better than White students, depending on the metrics evaluated, their educational advantages decline after residing in the U.S. for several generations (Hsin & Xie, 2014). Therefore, some aspect of being a White student in U.S. schools confers enduring advantages that are not available to, or sustainable for other racial groups here.

It is important to reiterate here that students generally experience classroom science as one particular iteration of science, rather than in a variety of ways science has been, or continues to be practiced by different cultural groups, throughout time. This singular vision of science has been more accurately described as Western Modern Science (WMS) by Glen Aikenhead (2006). WMS positions the endeavor of science securely within Western customs, traditions, and paradigms of thought. For instance, the predominance of rationality in the Western desire to *explain* the world rather than *experience* it, leaves no room in science for the mysticism and spirituality that tend to be dominant aspects of other ethnic cultures. This creates a scenario where students are unable to engage in recognized and appropriate science practices without first embracing Western ideals (Aikenhead, 1996). This phenomenon contributes to various conflicts between students and science instruction that the author has

attempted to categorize under two broad headings: 1) conflicts with science as tradition, and 2) conflicts with science as a culturally homogenizing entity.

In most instances, school science (the methods of scientific practice associated with traditional K-12 settings) is conflated with the enterprise of science; a tool for understanding the world around us. This understanding is problematic because it ignores the fact that the very structure of schools superimposes its own set of values onto science prior to student interaction with science. Grimburg and Gummer (2013) view the culture of school and the culture of science as oppositional; citing examples of how partitioned school days (i.e. students transitioning between unrelated school subjects based on the period) constrain the open-ended nature of science, in much the same way that traditional teacher-centered instruction limits the *practice-knowledge* cycle integral to the construction of new scientific information and/or lines of inquiry. These phenomena distort the nature of science into what can be more appropriately differentiated as *school science*. However, traditions associated with K-12 science instruction continually transmit false ideologies (e.g. when people hastily conclude that this generation of students does not appreciate science as much as prior generations) that obscure the fact that cultural conflicts with school science are generally *not* conflicts with science, the human endeavor. For instance, a recent survey discovered that nationwide, students have interests in science fields but are averse to those subjects in formal school settings (Change the Equation, 2016).

One such problematic tradition in science instruction is the depiction of science as an established body of facts, which is continually built upon and solidified as humans grow in depth of understanding of the world around us. This stance, assumed by the science educator

and forced upon the science learner, leads to the highest value being placed on the delivery and acquisition of *known* science, relative to the advancement of *new* science. This view ignores the reality that science is comprised of very few objective truths, but rather, is comprised of tentative ideas that are highly subject to change and refinement as new information and data collection methods become available (Appleyard, 2007). For example, consider how important concepts like the number of planets in our solar system (Hogan, 2006; Toth, 2016), or the initial labeling of dietary cholesterol as the primary determinant of high blood cholesterol (Berger *et al*., 2015) have changed in recent years. Additionally, it overemphasizes the depth of what is supposedly *known* relative to the infiniteness of the unknown and potentially unknowable.

Researchers Gilbert and Yerrick (2001) echo this point when lamenting that current instructional approaches obligate students to roles as science consumers, versus stimulating them to produce new science. Similarly, Thadani and colleagues (2010) note that in urban science classrooms teachers often operate under a *pedagogy of poverty*, which assumes students have little to offer to successful learning environments and thus are best served by focusing on the memorization of facts presented by instructors. In addition to this practice being in stark contrast to what is deemed best practice in science instruction, it is noteworthy that urban classrooms in the U.S. have the most varied student demographics, which have been speculated as one of the greatest untapped resources for scientific progress (Emdin, 2012). These traditions serve to contradict one of the main purposes of science instruction, which is the advancement of science through new ideas arising from newer generations of diverse science learners.

Despite national documents outlining new pedagogical approaches towards more productive science learning in U.S. classrooms since at least the early 1990s (National Research Council, 1996; National Science Teachers Association, 1992), an overwhelming number of science educators struggle in their efforts to move away from traditional science instruction practices. For instance, in their meta-analysis of science classroom tensions, researchers Camillo and Mattos (2014) reveal one of the main conflicts occurs when teachers want to teach knowledge for the workforce (e.g. focusing on lab skills, organized note taking, etc.), while students want to learn science connected to their present lives and situations. The preoccupation with K-12 *schooling for the workplace* is an example of the school-to-factory model of education that is an ongoing tradition in U.S. education; one that science instruction is not immune to. Basu and Calabrese-Barton (2006) convey a similar point, making an argument that many teachers are ignoring student interests, choosing instead to subject K-12 students to a decontextualized version of science (Buxton 2010). These researchers argue that student interest is, in fact, the basis for productive science instruction. They note that students often display a disdain for in-school science and its traditions of practice, all the while holding a general interest and curiosity in science outside of the school context (Basu & Calabrese-Barton, 2006), such as enjoying science television shows, science museums, or other informal science education opportunities, like guided nature walks.

Student interest in the subject of science, like all other subject areas, arises from the various intersections of their lived experiences. However, due to the enduring tradition of describing science as an objective venture, many science educators avoid the messy intersections of science and real-life, in attempts to avoid subjectivity. Geilsa Costa Santos

Baptista and Charbel Niño El-Hani (2009) offer an exemplar documenting how the avoidance of real-life issues that intersect with science can hamper student learning. In their study, in a non-grade banded Brazilian high school science classroom, students received a curriculum honoring student knowledge as subsistence farmers, but the teacher avoided addressing socioeconomic tensions between the various working-class students in her classroom. The teacher felt uncomfortable negotiating these topics within a science classroom, even though various interdisciplinary connections between agriculture, economics, and sociology may have cemented students' science content knowledge and bypassed the tensions that undermined the goal of this specialized, inclusive curriculum.

The tradition of avoiding messy, socioeconomic topics in science classes serves to reinforce current achievement gaps between students. Christopher Emdin (2011) argues that science classrooms act as microcosms of society, and that by not giving students full citizenship in class, they are likely to reproduce the familiar inequities they experience outside of school. One aspect of full citizenship he calls for is the incorporation of democracy, where students can openly discuss complicated issues that are moderated or facilitated by teachers, as these issues color the lenses they see the world with both inside and out of classrooms. Similarly, Emdin (2012) argues that typical measures to reach students of color in urban science classrooms are ineffective because they push for equality-based practices (e.g. aim to give all students the exact same classroom experience), rather than equity-based solutions (e.g. aim to give students what they specifically need, which may be different for each student in the class) that are informed by and use student input on the teaching/learning approaches that would best serve them. Previously, Agyemon (2003) claimed a similar notion when discussing the landscape of

environmental education and related research. He argued that the lens in which science education and related research is conducted is distorted by racism and Whiteness, and thus glosses over the both the racialized injustices students face in science classes, as well as those committed by science education research. A prime example of science classrooms as a site of racialized injustice is observed in the phenomenon of racial minority students, excluding Asians, being underrepresented in AP or advanced science classrooms nationwide (Theokas & Saaris, 2013).

Social Justice in Science Education

Having outlined the myriad ways that in-school science enacts a sort of violence upon students, particularly students of color, many researchers and science educators have called for social justice in science education (SJSE). The result is a wide range of approaches aimed at creating science classrooms that affirm students, and consequently, depict truer representations of the nature of science. They do so by upholding science as a subjective venture, which is heavily influenced by every scientist endeavoring to better understand the world around them. These versions of science instruction can be lumped into three main categories based on their particular emphasis: *classroom interactions*, *social action*, or *student identity*.

Emphasis on Classroom Interactions

For students in classrooms that focus on classroom interaction, educators attempt to shift students from mere science knowledge consumers, to producers of science content (Zembylas, 2005), by disrupting traditional K-12 school paradigms that govern how students relate to each other and/or to the instructor. One exemplar comes from an emphasis on

science as argumentation. This approach focuses on the pursuit of science knowledge as a collective venture, whereby individuals collaborate to strengthen the claims and explanations drawn from data collected (Chin, Yang & Tuan, 2016). Developmentally, adolescents are driven by social interaction with their peers. Science classrooms where students have to explain and defend conclusions to peers, instead of only to the teacher, capitalize on students' desire to socialize, while reinforcing the notion that collaboration is a cornerstone of the nature of science (Evagorou & Osborne, 2013).

Another approach utilized by science educators focuses on disrupting the typical *teacher-student* power dynamic where teachers wield all decision-making power. These teachers choose instead to relinquish some control to their students. In these democratic science classrooms students get freedom of choice in various classroom dynamics, such as choice in assessment (O'Neill, 2010); classroom rules and enforcement (Emdin, 2011; 2012); and even course scope and sequence (Seiler & Gonsalves, 2010). By opening up new methods of interaction across lines of power, students are also encouraged to pursue new lines of science inquiry. A similar approach allows learners to engage in co-teaching, where students take turns sharing their own expert knowledge with classmates, rather than the teacher controlling all knowledge transmission.

In Christopher Emdin's (2011, 2012) research, this looked like students tutoring each other and making sure each of their peers were prepared for class and that their ideas were acknowledged and validated. Other teachers allowed students to educate peers on how to care for classroom pets (O'Neill, 2010), plants (Tan & Barton, 2010), and even each other, using traditional herbal medicine (Upadhyay, 2010). These approaches expand students' conceptions

of science as a venture regulated by a narrow range of interpersonal interactions, opening up new possibilities for participation and access to individuals who would not be considered specialists yet. This ideology leads into another aspect of SJSE, which focuses on science for social action.

Emphasis on Social Action

While many teachers believe that the work they do with students impacts the future, some science teachers understand that classroom instruction can also be directly measurable when students engage in science-based social action. In some spaces, this looks like citizen's science, where non-professional scientists (average people) collaborate in research with professional scientists (people with official titles, degrees, or certifications in STEM fields).

For example, citizen volunteers and ecological research specialists at the Cornell Lab of Ornithology worked in tandem to produce management recommendations and conservation plans for various residential areas (Cooper et al., 2007), which generally are overlooked areas for habitat restoration efforts. Nationwide, K-12 students have also worked with researchers to combat global warming, habitat fragmentation, and wildlife decline while subsequently developing science content mastery in a relevant context, through participation in national citizen's science projects coupled with integrated science curricula (Bhattacharjee, 2005; National Science Foundation, 2018).

In addition to citizen's science, environmental education offers another means of turning conservation issues into science learning opportunities. This approach helps students to decipher the complex relationship between economics, civic responsibility, justice and the environment, and then empowers them to affect change within those arenas. As a case in

point, Costa Rican students used their knowledge about the conservation issues affecting their country to perform social actions such as blocking illegal tree harvesting and admonishing adults who polluted local water systems (Locke, 2009). Similarly, other students made recommendations at a municipal forum to improve conditions at urban brooks (Conners & Perkins, 2009). These various social actions show how student learning within a relevant context not only increases access to the content, but manifests in ways that contribute to society above and beyond the scope of what traditional instruction might achieve.

Emphasis on Student Identity

Another method of SJSE enactment is expressly aimed at addressing conflicts between students' home cultures and the culture of Western modern science (WMS). To challenge this, educators create the space for learners to bring more of their whole selves into science classrooms through a variety of techniques. One such tactic is predicated on realizing that distinctive cultures employ different communication styles as cultural practice. Viewing this diversity as something that can enhance learning in science classes, rather than oppose it, is one pillar supporting the idea of dialogic instruction. Dialogic instruction aims to mesh students' viewpoints with instructor ideals into a singular line of inquiry (Lehesvouri et al., 2011), by making classroom learning more of a back and forth conversation instead of a top-down forum. These conversations can take on various forms. For instance, in Upadhyay's (2010) research, students use of Hmong in an all-English language middle school in Minnesota, allowed for more equitable access to the curriculum. Similarly, the use of *bay odyans*, a Haitian style of argumentation, was used in a Haitian bilingual middle school in Massachusetts to facilitate students' ability to appropriately link their science claims and reasoning (Hudicourt-Barnes,

2003). Not only has language been a site of increased access, but the incorporation of students' various musical interests (Emdin, 2009; Vareles et al., 2002) and their cultural/traditional knowledge (Baptista & El-Hani, 2009) has been used similarly.

Collectively, these SJSE strategies employed in science classrooms around the world attempt to expand on the imprecise depiction of science as a monoculture. It is noteworthy to mention that many of these examples concentrate on topics that concern the environment or agriculture. These arenas of science emerge from very obvious intersections between science and society, and thus make accessible entry points for science education that has a personal feel. Nutrition education serves as another gateway for science learning that is both personalized and also contributes to valuable content mastery.

Nutrition Education

Although STEM education is highly valued in our technological society, the struggle to make it seem relevant to students has proven to be a challenge. Some would argue that nutrition education, on the other hand, is a science field that is both more vital and extremely relevant for a multitude of reasons. In terms of relevance, consider how the next opportunity for nutrient intake is not only a recurring concern of most growing adolescents, but also, in general, eating is highly imbued with cultural values and traditions for all groups of people (Roche et al., 2015).

Despite the significance of this subject and the fact that most U.S. schools are required to teach nutrition education at some point during the K-12 experience (Kann et al., 2013), young people continue to observe poor eating habits that contribute to the growing obesity and diabetes epidemic (Ogden et al., 2014). This may be caused, in some part, by the fact that

students are not receiving enough hours of nutrition education to bring about more positive behavioral change (Porter, Koch & Contento, 2018), or this may serve as another reminder of cross-cultural conflict between WMS and the diverse cultural practices of students.

In order for students to integrate the health-promoting food practices learned in school, those same values need to be reflected within the meals provided at school and at home (Perera et al., 2015). When the discrepancy lies within school meals, students intuit mixed messages about the importance of healthy food choices. On the other hand, when students discern that the *healthy* foods they learn about at school are quite dissimilar to the *unhealthy* foods eaten at home, students may complain to their primary care providers, which fuels resentment between the family and the school (Downs et al., 2012). This antagonism stems from the fact that food choice often occurs at the junction between culture and necessity (Padrao et al., 2017), so parents/guardians likely provide those unhealthy food options for reasons beyond a lack of knowledge. Nutrition education then, must actively engage with cultural responsiveness based on the learner population to avoid these unnecessary conflicts (Perera et al., 2015). One such movement associated with this sort of culturally responsive nutrition education is *diet decolonization*.

As described earlier, diet decolonization is a socio-political movement aimed at reconnecting various cultural groups with more traditionally accurate food choices. These foodstuffs tend to be healthier (i.e. generally plant-derived, with less saturated fat intake) than the food alternatives representing cultural foods of today (Esquibel & Calvo, 2013; 2017). Diet decolonization acknowledges that due to the history of U.S. American imposition and its legacy of forced cultural assimilation on conquered peoples and immigrating populations, most

"cultural diets" exist more precisely as bastardized derivatives of the originals. Engaging in this movement usually requires individual research via texts or knowledgeable community elders. In helping people to decolonize their diets then, it not only serves as a health-positive act, but also as an act of rooting one's identity through a reconnection with one's elders/ancestors (Esquibel & Calvo, 2013; 2017). Approaching nutritional education from this perspective serves as a transformative example of SJSE, in that students have an opportunity to learn science content within a relevant context, capable of reinforcing and re-establishing identity, while also having implications for family and community level social action. In order to equitably involve families and communities in this process, participatory action research may prove a valuable resource.

Participatory Action Research

Traditionally, the WMS research paradigm proposed that effective research required scientists to traverse the steps of the "scientific method" on their own, as the educated and experienced persons, eventually settling on a research question and the means to go about answering it. On occasions when the question at hand dealt with uncovering the basis of some phenomena directly involving other humans, those individuals were merely treated as subjects for research. Research, particularly ethnographic research, employed these methods for decades as part of the positivist, and later post-positivist traditions of scientific thought. With the onset of alternative epistemological movements, such as feminism, Critical Theory, post-colonialism, post-modernism and post-structuralism, more attention was given to the power differential between researchers and subjects (Mirra et al., 2015).

Participatory action research (PAR) emerged as a mode of inquiry aimed at interrupting the lopsided researcher-subject power dynamic. PAR seeks to elevate subjects to the status of

research participants, whose advice and approval is sought out during portions of the research design (Torre & Fine, 2006). They become equal stakeholders in the research by assisting in the formulation of the research questions and methodologies, as well as the analyses and eventual dissemination of findings. The scope of PAR is vast, as various groups of people are involved in a myriad of projects ranging from technological development (Schiau et al., 2018), to informing public policy (Sandwick et al., 2018) and educational programming (Paredes-Chi & Castillo-Burguete, 2018). Focusing more intently on the intersection of PAR and educational research underlines aspects of PAR relevant to the current study.

In the U.S., K-12 education is compulsory and functions as a gatekeeper for most forms of employment and, accordingly, directly affects earning potential and the ability for future adults to climb the class ladder. On the one hand, the educational system here in the U.S. unequally services students of color relative to their White peers (National Center for Education Statistics, 2015). While much educational research, policy, and their consequent initiatives seek to upend this achievement gap, the bulk of this educational programming occurs without the express input of youth. In recognizing the absence of a primary stakeholder in this sequence, youth participatory action research (YPAR) was formed. This framework is designed to explicitly challenge problematic narratives about young people, especially those living in poverty, attending underserved schools, and having other “at risk” designations by showing these students are capable of engaging in rigorous academic scholarship when they can lend their minds and voices to tackling real problems that affect them (Mirra et al., 2015). YPAR builds upon the PAR model by involving youth input in developing, implementing, analyzing and

reporting essential findings that have the potential to directly affect the lives of the adolescent researchers.

Numerous YPAR studies have shown students' remarkable ability to transcend well-beyond the lowered expectations typically afforded them based on their socioeconomic status. For instance, youth have collaborated with university researchers to find potential locations, funding sources, and community-requested emphases for community centers in California (Ardoin et al., 2014). Youth also discovered spaces for activism and civic engagement through a geographic mapping project of their surrounding community in Seattle (Gordon et al., 2016). Some recent studies also demonstrated YPAR's capacity to enhance nutrition education. Antwi Akom and colleagues (2016) engaged East Oakland youth in a research project aimed at identifying the realistic prospects of locating healthy foods in their neighborhood. Students used GPS and GIS technology to land map their communities, highlighting locations where fresh, whole foods could be obtained. When they found that their neighborhoods were not properly identified as "food deserts" in governmental records due to the classification of gas stations as distributors of healthy food options. The students presented their findings to various local, municipal, and state bodies, ultimately securing additional health-promoting resources for their community. This study confirms the unique ability for YPAR to not only engage students in high level science content learning, but also to create spaces for them to generate their own science knowledge. When this knowledge can then be used to influence their immediate circumstances by equipping them to solve problems they have a vested interest in, the learning takes on a transformative function.

CHAPTER III: APPLICATION OF THE RESEARCH

Evidence-Based Rationale

The setting for this application project revolves around a nutrition class I teach that has illuminated a need for more culturally responsive pedagogy. This need arises from an unanticipated clash between students' cultural identities and their newly acquired scientific understanding. For example, based on their learning, students have regarded many of their cultural meals as unhealthy, and feel that I am asking them to choose between their culture and their health. Whereas the information transmitted is positioned as objective and neutral, the implicit goal of nutrition education is to interrupt negative health trends by empowering students to make more health-conscious selections based on their new understandings (Perera et al., 2015), and as such, has political underpinnings. This becomes problematic when the official and authoritative status of the information causes its political nature to shift into something that jeopardizes students' connections to their cultural beliefs and customs.

The primary goal of the course, as handed down from the associated college, is for students to develop a basic understanding of nutritional concepts and the various effects of nutrition on the human body. In order to meet this course objective and remain cognizant of the way official knowledge (e.g. information from official or professional sources) can act as a dominating presence (Kooijmans & Flores-Palacios, 2014), I intend to introduce diet decolonization as a mitigating factor. Diet decolonization is a movement at the intersection of nutrition and socio-political awareness that reinforces sound nutritional concepts through post-colonial awareness and action (undertakings meant to cast off any outside cultural influences resulting from colonizing forces). Engagement with this movement introduces people to their misplaced, historically-accurate cultural diets that are more plant-based, lower in saturated fats,

and less processed than their present-day U.S. equivalents (Esquibel & Calvo, 2013; 2017). Nutrition instruction that includes the perspective of diet decolonization then, satisfies the main objective of the course by being attentive to basic nutritional concepts regarding macromolecule, vitamin, mineral, and food additive intake and their enduring effects on the body. To address the additional secondary objective, helping students to integrate the new nutritional information in a culturally sensitive way, I propose YPAR as a framework for the construction of the class and as a guide for student engagement with diet decolonization.

The aforementioned secondary objective is aimed at opposing the tendency for science learning to act as a Trojan horse for the espousal of Western ideals, at the expense of other valuable cultural philosophies (Aikenhead, 1996). While diet decolonization is centered around the distinct cultural histories of various ethnic groups, and as such is culturally relevant (Esquibel & Calvo, 2013; 2017), my concern is that by merely encouraging students to think about decolonizing their diets as a health-promoting practice, I would function as the imposing influence. This concern is two-fold given that a) teenagers tend not to be fully in control of their diets and food options anyway (Jain & Pathak, 2016), so external pressure to conform to new diets outside of their sphere of influence may come across in unintended ways, and b) as the classroom teacher, I am aware that even my personal opinion is often interpreted as official knowledge, and thus is more likely to position me as a colonizing force within classroom spaces.

YPAR can help alleviate both of these concerns. YPAR specifically is designed to empower youth to help design and implement curriculum that can lead to change in their communities (e.g. Ardoin et al., 2014; Gordon et al., 2016; Sandwick et al., 2018), in this case personal and community health. These micro/macro changes are a direct result of using science learning to address actual situations in students' lives. Accordingly, students not only are more

engaged in the learning, but also the subsequent assimilation and application of values and information learned in class (Merritt et al., 2017). For my study, a combination of nutritional unfamiliarity and well-regarded cultural practice contributes to the student-identified, malnutrition-related effects on the health of their community. Within a YPAR framework, students can move beyond simple diagnosis of the issues leading to these health concerns, and into the realm of action.

In previous settings, YPAR has been shown to be particularly effective in creating real change for people of color and other marginalized groups, especially when working toward educational and environmental justice solutions (Ozer, 2016). However, many of these ventures are attributed to collaborations between youth and social justice-oriented programs that are not part of their formal schooling (Ozer & Wright, 2012). This indicates a need for this work to permeate school environments where a greater majority of youth can be reached who have similar community problems to those currently being addressed by YPAR. In the present study, the common thread revolves around building healthier food practices in the community. Researcher Emily Ozer describes YPAR as "well suited to address inequalities in health and education" (2016, p. 195) due to a number of synergistic factors unique to youth engagement, including their valuable insider expertise. I believe these factors would also hold true in helping to bridge a gap between official knowledge and the nutritional education in this community. I find this is especially relevant in light of the confusing and ever-changing grasp of foods' effects on our bodies. To that end, YPAR specifically has been highlighted as a valuable tool for increasing the inquiry skills of youth (Ozer, 2016) who have to wade through an increasing tide of (mis)information to develop into the healthiest versions of themselves possible.

Explanation of the Project

YPAR as a research paradigm calls specifically for a repeating *inquiry-action* cycle that confounds the idea of mapping out any one particular research path. This is further complicated by the fact that both components of this cycle necessitate the participation of youth. At this juncture, I am the only contributor, and will later have to enlist the help of my youth participants once students are registered in my course. I can, however, outline a tentative plan for research proceedings, and what materials and experiences I think would be valuable to students in this journey.

At the onset of the course I would like to spend the majority of the first two weeks (roughly 4-5 classes with block schedule) on community building activities. Having a strong sense of cohesion in the group will be integral to the functioning of this research endeavor, but overall is useful in any collaborative learning environment. These activities will likely include forming a restorative justice circle, collaborating democratically to develop classroom norms and policies, and engaging in various activities drawn from the *Venture Team Building* website. After we have a working sense of classroom community, we will begin to engage the course content.

I plan to teach the first few chapters of the textbook normally, laying a foundation for interpreting nutrition labels, understanding dietary recommendations, and our present understanding of the role of proteins, carbohydrates and fats in our diets, and subsequently, our bodies. At each stage of this process students will be asked to reflect upon their diets and the diets of their family members as they grow in understanding of these nutritional concepts. These reflections are what generally lead students to identify various health concerns they have for themselves and their surrounding community members. At that point I plan to begin the first *inquiry-action* cycle.

Once I start to notice a theme, I will convene students for whole-class discussions regarding the patterns we observe in the various reflections. This will facilitate the process of identifying community-level health concerns. Once we label the common concerns, I will engage students in brainstorming various courses of action to address them. The answer, or one of the answers I presume, will be some sort of public service announcement. At said point I will ask students about the types of information they think are most important to share (e.g. what sort of facts, what resources, what kinds of diets, etc.). Once we have generated a pool of information to be distributed, I will ask students to start thinking about how this information might be received. I will ask them to reflect on their thoughts and feelings surrounding mismatches between their diets, especially culturally-inspired food choices, and the numerous recommendations for healthy living. I will ask them to ponder on how they think other people might receive this information, and what types of conflicts might arise.

Once students have begun to contemplate these challenging questions, I will appropriate class time for them to engage in independent research. Students will be tasked with locating different diets or ideals that purport to not only be healthy but also potentially help avoid some of the cross-cultural conflicts previously identified. If students struggle with finding applicable diets I could provide a list of websites to research, including the diet decolonization website. Later, we will convene to discuss the merits of the different diets in terms of potential health benefits and levels of cultural relevance or sensitivity. I believe we would eventually settle on the idea of diet decolonization, but given the YPAR framework, I must remain open to the possibility of students suggesting something completely outside of my present thinking, that still accomplishes the intended goal.

Assuming we agree upon investigating the diet decolonization framework, I have several sources in mind to help students learn more about their cultural diets of yore. Given my school community is so diverse, I need to locate many different local experts from these various communities to act as potential resources for them. Some groups I have discovered include a Karen weaving circle, which is a group of Karen elders who meet regularly to engage in cultural craft and dialogue. I am also aware of the Hmong cultural center, and Hmong tapestries in a local library that tell stories of the Hmong way of life, including farming and food practices, prior to coming to the U.S. I also have contact information for a local Native American chef who recently opened a Native American restaurant that focuses on decolonized versions of Native foods. More legwork will be necessary, but students, with their valuable insider knowledge, may also have valuable resources available to contribute. Only after we have a working body of resources, and a good grasp on culturally-appropriate nutritional practices can we figure out how this knowledge can best be used to improve the community.

Details About the Audience

Washington Technology enrolls roughly 2200 students in grades 6-12, and is a 100% free and reduced lunch school, meaning that all students come from low-income families. The school has a 2017 graduation rate of 86.2% (Minnesota Department of Education, 2018), and 13% of students enroll in Advanced Placement courses. It is located in the North End neighborhood of Saint Paul, MN. The school population includes a high number of recent immigrants with many students immigrating from various Southeast Asian and African countries; this supports the fact that 59% of students have limited English proficiency.

These materials are being created for Washington Technology Magnet School students enrolled in my concurrent enrollment class (earning college credits within a high school setting)

offered through Saint Paul College (SPC). The course, entitled SPC Nutrition, is a 3-credit semester-long review of basic nutritional science and what is known about how nutrition works with our body systems to affect our overall health. Most students enrolled are junior or senior high school students, with an opportunity for a small fraction of the class to consist of sophomores, all of whom are taking the course as an elective. In order to register for the class students must achieve either a) a score of 60 on the Accuplacer Reading Comprehension test, or b) a score of 3 on the Reading Placement test. Neither of these scores are high above average on the range of possible scores, and as such, many students enrolled in the class are not strong readers. All of my students over the past few years speak English as second language, sometimes as a third or fourth language. All of these students display English competency but most struggle with comprehension of college-level science textbooks or other high lexile readings. Additionally, most of the students do not have a lot of experience reading science textbooks prior to taking the course, so this is compounded by their lack of practice.

If this venture is successful I imagine Saint Paul College (SPC) might be interested in using the material in some form. No one else teaches the course at my school besides me, so no one else at Washington would likely be interested. The instructor at SPC, however, has mentioned wanting to improve the cultural relevance of her course. I could use this interest in improving the cultural relevance of the nutrition course to help spread the curriculum to additional venues at the local college level.

Resources needed

For the present application project, I do not foresee many resources being necessary that are not already readily available at Washington. For instance, students will need the current textbook we use, that is made available to them in our library. They will also need the internet to

do research, but we are a 1:1 technology school, so every student already has an iPad with internet accessibility. Other unforeseen resources may arise later, but this will depend entirely on the design of the YPAR project as presented by the students.

Sustainability

This action research project will take place in a course that requires various levels of certification and education (i.e. either advanced degree in life science field, or undergraduate degree with proof of extended coursework or certifications in related life science / nutrition fields of study) that other life science instructors at my school are not presently qualified for. As such, the course is not sustainable in my absence, and accordingly, neither is the present action research. Provided I continue to teach this course, however, the sustainability of this endeavor is very high, as I will continue to make contacts that can be used as resources to help students from a multitude of cultural backgrounds investigate and improve their health in whichever form YPAR takes in subsequent years.

CHAPTER IV: DISCUSSION AND CONCLUSION

Summary

The present literature review investigated the potential effect of a classroom intervention using diet decolonization and a youth participatory action research (YPAR) framework on high school students' understanding of nutrition science content and cultural food practices. I determined the combination of these two ideologies shows vast potential to both convey important content specific information (Akom et al., 2016) by means of a culturally-relevant presentation (Esquibel & Calvo, 2013; 2017). Additionally, the YPAR approach is likely to mitigate some of the potential harm arising from instructor encouragement to adopt new dietary practices (i.e. diet decolonization), as students would be arriving at this conclusion based on dialogue with a facilitator (i.e. the instructor) and their own research merits (Mirra et al., 2015). While the literature suggests helping students embrace healthier diets as a meaningful course of action, social-justice texts centralize the importance of being reflective at the onset and during all stages of the research (see Baptista & El-Hani, 2009 for an example of the danger of forgoing ongoing reflection). With the deep intersections between diet and cultural practice (Roche et al., 2015), extra precautions are necessary to avoid causing students harm.

Professional Application

The present action research plan could be applied to any context in which nutrition education is being taught to secondary students, especially in urban school districts in the U.S. For most K-12 students here in the United States, it is likely students observe poor dietary practices, given national malnutrition trends, and also have varying degrees of disconnect from

historically-accurate diets relative to their ethnic backgrounds. While this framework could be used to connect various student populations with healthier diets and reconnect them with their cultural identities, the YPAR methodology has the additional benefit of empowering students to affect change in their communities. As such, this type of action research plan may also be advisable wherever there is a desire to incorporate civic engagement into curriculum or explore avenues for interdisciplinary education, especially in low socioeconomic communities typically plagued by health disparities.

Regarding Minnesota specifically, this research may help to combat the achievement gap in science learning (i.e. 42% of White secondary students meet standards compared to 5.7% of Blacks, 24.1% of Latino, and 33.9% of Asians; Minnesota Department of Education, 2018) by increasing the cultural relevance of science instruction in the Twin Cities. Here, the increasingly diverse student body, presents many opportunities to use students' various cultural backgrounds as inroads to relevant instruction. The extent of this achievement gap among students of color and White students in Minnesota suggests that more work needs to be done to connect diverse students to STEM education. Utilizing science instruction that is both culturally enriching, and participatory may serve to bridge the gap between the school and home lives of students, ultimately leading to improvements in content mastery.

Limitations of the Research

While the scope of literature reviewed is comprehensive, it is not all-inclusive. The research question operates at the intersection of several expansive, and deeply-rooted research fields, including: *Social Justice in Education*, *Science Education*, *Nutrition Education*, *Post-colonialism*, *Critical Theory*, and *Participatory Action Research*, to name a few. Accordingly,

my capacity to review all possible materials related to the topic was primarily limited by time. Therefore, additional research studies offering valuable insight into the particular dynamics of this study are potentially missing from the literature reviewed. Despite this possibility, it is improbable that there are published studies investigating how YPAR, in conjunction with diet decolonization, affects student learning. Based on the combination of various search terms used to locate articles, it is very unlikely. Furthermore, no studies were found that involved an empirical assessment of a diet decolonization intervention, let alone within a K-12 school context.

Implications for Future Research

Here, at the planning stage of this project, I realize there are many prospects for research into K-12 nutrition education with specific attention to cultural relevance. The majority of nutrition education research studied deals with medical school students or school-wide nutrition programs (e.g. breakfast in schools, vending machine restrictions, etc.), and does so without specific attention to how culture and diet interact. This suggests that either most K-12 school systems do not have explicit courses regarding nutrition (per the literature, this content is typically rolled in to the mandatory health curricula), or that researchers are not capitalizing on the opportunities present. In order to more faithfully halt, and potentially reverse the growing malnutrition trends in the U.S. Our K-12 students need additional nutritional education bolstered by sound, research-based practice.

In addition to the implications for future research needed, broadly speaking, there are some specific assumptions I hold regarding my students and the effect this research might have that must inform how I enact this specific project in the near future. Failure to acknowledge the

various ways in which these biases may creep into the research project may contribute to undo harm upon my students and/or the communities they represent. For example, one underlying premise of this research project is that students do not generally observe healthy dietary practices, based on the observation that they have not in previous school years. While it is true that, overall, adolescents nationwide observe unhealthy dietary practices (see Jago et al., 2011; Ogden et al., 2014; Schnettler et al. 2017), this may not hold true for the particular population of students in my class this upcoming school year. This is due in part to a large part of my student demographic consisting of recent immigrant/refugee families who may not have adopted unhealthy western dietary practices.

This specific context elucidates another important assumption, that students do not already observe the historically accurate, and health promoting diets that a diet decolonization framework would suggest. Consider that it has been observed previously that cultural foods have been found to contribute greatly to adolescent diets (Gutierrez, 1999), although these diets were not evaluated for their historical accuracy. With my population of students consisting of high numbers of recent immigrants, there may be a higher proportion of students who eat historically-accurate diets compared to the general U. S. student demographic.

An additional personal bias uncovered was that students may not have as much motivation to adopt more healthful practices as I think they *should* have. Students may, in fact, conclude that their diets are unhealthy, understand how they might be altered to promote health, but not be interested in making said changes. Prior research has demonstrated that food knowledge does not always manifest in dietary changes (Ferris et al., 2017). This phenomenon results from an intricate matrix of different social, economic, and cultural factors

influencing an individual's food choices. For example, recent immigrants, like many of my students, often feel a pressure to conform to the values and customs, including food practices, of their host country (Angelini et al., 2015). Accordingly, there may be perceived social benefits for immigrant populations to observe cultural diets that are in line with contemporary U. S. American standards.

Another important consideration to make is how my own middle-class, Black family upbringing informs my conception of the parent-child dynamic. This dynamic will likely be a mitigating factor in students' abilities to negotiate diet decolonization. For instance, during childhood, I ate what was available and had little room to suggest alternatives to my mother. This phenomenon, I assume, is more likely attributable to the *Black* aspect of my family, rather than the middle-class component. Many of my students come from very different backgrounds than me, and so I cannot accurately speak to whether student nudging of the family into dietary changes will violate any cultural norms related to the decision-making power over food choice in the family. In light of the fact that some parents already think they encourage healthy diets (Kalavana, Maes, & De Gucht, 2010), especially mothers (Tabbakh & Freeland-Graves, 2016), this may be a source of tension.

It is imperative that future research involving nutrition education interventions in K-12 school systems, including my own, takes heed of these sorts of biases to avoid undermining well-meaning research endeavors. The present research study will address many of the gaps in nutrition education literature related to how YPAR can be used to motivate dietary change in students, and how diet decolonization can be used to improve health practices in a culturally responsive manner. Additional research into the intersection of gender roles and cultural food

practices might also be useful as a future course of action. Research questions like the one driving the present study arise from the intersection of, at the very least, themes such as diet, economics, and culture. Therefore, these types of studies require extra attention to the researcher's various prejudices and subjectivities within these areas, that have implications for the outcomes of associated research.

Conclusion

This literature review with application emphasis sought to answer the research question: How does scientific research suggest knowledge of decolonizing diets in conjunction with YPAR might affect high school students' understanding of the relationship between healthy eating and their cultural food practices? According to the literature, the use of these two paradigms has potential to increase students understanding of nutrition science content, and enrich their understanding of cultural diets, while promoting healthy changes in their community.

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