TEACHING FOR SOCIAL JUSTICE WITH STUDENTS FROM PRIVILEGED

GROUPS:

INTEGRATING SOCIAL JUSTICE INTO MIDDLE SCHOOL CURRICULUM

by

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The following individuals read and discussed the dissertation submitted by student Bong Seok Jang, and they also evaluated his presentation and response to questions during the final oral examination. They found that the student passed the final oral examination, and that the dissertation was satisfactory for a doctoral degree and ready for any final modifications that they explicitly required.

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DEDICATION

To my Grandmother, Bo Deok Lee (   ),

thank you very much for taking care of me and showing me the ways of the world since I

was young. I hope you live a long healthy life and one day my children are blessed by

getting to know you.

To my mother, Jeom Rye Yun (   ), for raising me in love and sacrifice.

To my father, Seong Won Jang (   ), for caring for me.

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ABSTRACT

This dissertation research focuses on the teaching for social justice with

privileged middle school students. A need for this research was established based on the

limited findings specific to teaching for social justice in mathematics.

This research was implemented with junior high level students in a public charter

school. The socio-economic status and ethnic diversity of the class in which this study

took place is primarily middle to upper middle class and ten percent nonwhite.

Qualitative research methods were used because this study focuses more on

human interactions in the natural setting of a classroom. First, my observations of the

social justice lessons and discussions were used. Second, students wrote reflection papers

that depicted their reactions to the data related to social issues. Third, I conducted in-

depth interviews with purposefully-selected students. All class sessions were video

recorded and interviews were audiotaped.

Real world income data related to class, gender, and ethnicity were used in the

mathematics lessons. Students were surprised at the income differences according to class,

gender, and ethnicity. Responses to the data showed that most students connected income

discrepancy with possible underlying issues such as discrimination, hiring bias, and

unequal opportunities based on class, gender, and ethnicity. In addition, students'

responses showed that they would take actions in pursuit of changes and social justice,

even though issues with underlying problems were not directly related to them. Students

also found mathematics as an interesting subject connected to real world situations. Some students expressed interest for additional social issue topics in their class. Finally, the results showed support for an interdisciplinary approach of social justice education into other subject areas.

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Introduction of the Problem

Multiculturalism has been one of the biggest issues in most countries, as economical, cultural, and political exchanges among countries occur more and more. Such international collaborations in various areas create minor social issues such as an increase of foreigners in each country and biracial marriages, and similar societal changes are expected to be more apparent and continue. In this social context, multiculturalism should be a subject people have to consider as citizens in a global community because it values and promotes diversity.

Multicultural education also became an important topic with the influence of multiculturalism in educational fields. For example, in the United States, researchers strive to investigate appropriate teaching methods, instructional assistance, and other possible guidance to help students of color, including African Americans, Asians, Hispanics, and Native Americans maintain successful academic achievements in schools (Sleeter, 1995). In addition, advocates of multicultural education emphasize that it could help students culturally interact and interchange differences between minority students and white students. Banks and Banks (1995) introduce multicultural education as a powerful tool in current society:

Multicultural education is a field of study and an emerging discipline whose major aim is to create equal educational opportunities for students from diverse racial, ethnic, social-class, and cultural groups. One of its important goals is to

help all students to acquire the knowledge, attitudes, and skills needed to function effectively in a pluralistic democratic society and to interact, negotiate, and communicate with peoples from diverse groups in order to create a civic and moral community that works for the common good. (p. xi)

In addition, Banks (1996) has identified and described five dimensions of effective educational multiculturalism: Content integration, the knowledge construction process, prejudice reduction, equity pedagogy and an empowering school culture and social structure.

Content integration refers to the extent to which curriculum integrates data and information from a variety of cultural backgrounds represented in schools. In other words, it deals with the extent to which educators use information from diverse cultures existing in schools. This dimension includes linguistic relevance of learning activities and communication in schooling (Minami & Ovando, 1995).

In addition, the knowledge construction process helps students explore not only the creation and process of knowledge, but also how the procedure is influenced by "the racial, ethnic, and social-class positions of individuals and groups" (Banks, 1995, p. 4).

The third dimension, prejudice reduction, involves attempts to reduce students' prejudice toward others from different racial, ethnic, and cultural groups. Educators can help students develop more positive and democratic attitudes toward people with different backgrounds by using materials that include contents about them.

The fourth dimension, equity pedagogy, involves techniques which can help raise diverse students' academic performance. Equity pedagogy could be related to culturally

responsive teaching, which describes how educators help increase diverse students'

academic achievements using cultural knowledge and diverse students' characteristics in

learning (Gay, 2000).

Finally, empowering school culture and social structure explains how to construct

the system and culture promoting educational equity in a school as one social system.

Explaining multicultural education, Nieto (2004) puts more emphasis on the fifth

dimension of Banks' effective educational multiculturalism. She describes multicultural

education as a comprehensive school reform:

> Multicultural education is a process of comprehensive school reform and basic
>
> education for all students. It challenges and rejects racism and other forms of
>
> discrimination in schools and society and accepts and affirms the pluralism
>
> (ethnic, racial, linguistic, religious, economic, and gender, among others) that
>
> students, their communities, and teachers reflect. Multicultural education
>
> permeates the schools' curriculum and instructional strategies, as well as the
>
> interactions among teachers, students, and families, and the very way that schools
>
> conceptualize the nature of teaching and learning. Because it uses critical
>
> pedagogy as its underlying philosophy and focuses on knowledge, reflection, and
>
> action (*praxis*) as the basis for social change, multicultural education promotes the
>
> democratic principles of social justice. (p. 346)

In addition, Lussier (2004) evaluates definitions and attempts of multicultural

education with three implications: Substantive, enduring, and transformative. According

to Lussier (2004), a multicultural education program could be substantive because of its

putting emphasis on marginalized issues and problems and addressing them into

curriculum. It also could be enduring, as it promotes continuous curriculum change due

to constant needs. Finally, it could be transformative because of its potential contributions

to a just and fair society.

However, researchers with critical approaches to multicultural education have

argued multicultural education has minimal effects on issues in current education (May,

1999). They believe that minority students are still sacrifices of racial prejudice and get

less educational opportunities and attentions. Curricula and activities in schools seem

almost to be monocultural (Ramsey, 2004). McLaren (1995) also emphasizes that

multicultural education should implement a political agenda unless its purpose is to end

up practicing a type of education to maintain current mainstream culture and power

status. Additionally, May (1999) points out that multicultural education has emphasized

curricula change and inclusive education, but it did not pay much attention to the

fundamental issues causing oppression and inequality.

In this context, social justice education can play an important role to help students

investigate social problems and bring about ideal changes followed by actions. Freire

(1998) used a similar term of action, praxis, which is a prerequisite to authentic education

and is composed of procedures of learning, reflection, and action. Social justice education

can supplement multicultural education by helping people acquire analytical tools. These

tools are critical in order to find oppressions in society and to help make improvements

by taking action in changing inequality that are deeply grounded. Taking action usually

refers to a special term in social justice education, developing a sense of agency, which

will be explained more in Chapter Two. In addition, social justice education can help

people see a bright side of educational purpose and prepare people to live democratic

lives (Sleeter & Grant, 1986).

> Education is a powerful tool for both subordination and freedom. Education is
>
> subordinating when it is unconnected to students' own experiences, when it
>
> stresses obedience, and when it demands that students accept other people's
>
> interpretations of the world. Education is freeing when it helps students think
>
> about their own lives, when it gives them skills and conceptual frameworks that
>
> help them pursue their own concerns, and when it helps them examine the barriers
>
> that keep them from success and attainment of the good life. (p. 299)

Moreover, social justice education has two merits: Teaching both content and core

values. Social justice teaching involves helping students learn content in all subject areas

and grade levels. It also emphasizes teaching core values, such as respect, responsibility,

service, and care (Wade, 2007). Wade (2007) defines characteristics of social justice

education as student-centered, collaborative, intellectual, critical, multicultural, and

activism.

Statement of the Problem

Social justice education helps students "understand the meaning of social

difference and oppression both in the social system and in their personal lives" (Adams,

Bell, & Griffin, 2007, p. 2). As society becomes more polarized, many educators believe

that social justice education can help people understand diversity, oppression, and ways

of collaborating with diverse people to create socially just societies where democratic and inclusive practices take place (Kallen, 2004).

Social justice issues like oppression have been included in some curriculum areas. In social studies, history is a leading subject area in which the contents cover a chronicle of events struggling for equality. English is another subject that promotes social justice using reading and writing skills. For example, students use language to find inequality and bring attention to these inequalities by participating in protests. They can also find ways to pursue social justice through authentic dialogue (Brindley & Laframboise, 2002). In addressing social issues, educators can criticize how science has been utilized to represent corporate values at the expense of social justice and human dignity (Barton, 2003). Music can also give opportunities to facilitate discussions with relation to social justice and equity (Frierson-Campbell, 2007).

Traditionally, mathematics has not been considered as a mechanism for work in equality. Teachers, however, can help students learn rich mathematics and motivate them through mathematics instruction promoting students to think in a socially conscious way (Willoughby, 1990). Teachers can introduce mathematics as a tool to interpret and challenge inequalities in society. Using this teaching method can also make mathematics more accessible and applicable because it is learned in the context of real-life and meaningful experiences (Gutstein & Peterson, 2005).

There is little research on whether or not using mathematics to teach social justice has been done with oppressed student populations, such as African American and Hispanic students who might have been the victims of inequalities in society. Even fewer

studies in teaching for social justice have been conducted with students from privileged groups. According to Goodman (2001), people from privileged groups resist challenges to the status quo and educators should motivate them to support social justice. For this reason, it is also important to teach social justice with privileged students. Through social justice education, teachers are able to give students opportunities to express what they think about inequality issues in society.

Research Questions

Throughout this study, I investigated privileged middle school students' perceptions of social justice through their responses to government demographic information on income distribution in the United States. I tried to answer the following research questions:

1. What are privileged middle school students' understandings of social justice?
2. Based on their own understanding of social justice, what actions might middle school students from privileged groups be compelled to take?
3. What are middle school students' perceptions of mathematics as a lens to see inequality in real world income levels?

Significance of the Study

Researchers in social justice education have strived to help minority students recognize social structures of oppression and to support them in finding their rights. However, little research has been conducted to show how educators help privileged

students identify oppression and then work for social justice. This study is significant because it investigated perceptions of privileged students toward a socially just society.

The second important part of this study is to explore the possibility of changing students' perceptions of mathematics. As per federal guidelines, mathematics is paramount. Students must do well in mathematics due to its importance in their lives (Hake, 2004). Their school schedule, their trip to the store, the preparation of their meals, and many of the games they play all involve mathematics. Mathematics is also a critical skill in the information age. The Department of Education considers it a key concept for this country to maintain its economic leadership. Throughout this study, students had opportunities to feel the power of mathematics and develop an interest to invest more time pursuing mathematics.

Organization of the Dissertation

This dissertation is organized into five chapters. In the first chapter, I discuss why I chose the research topic and its significance. Research questions are also provided.

The second chapter includes three theoretical backgrounds of this study: teaching for social justice with students from privileged groups, teaching for social justice with middle school students, and teaching mathematics for social justice. Three research questions were developed based on the theoretical backgrounds above.

Chapter Three outlines the research design and methodology used to address how I interpreted privileged students' perceptions of social justice. Details are provided of data collection such as classroom discussions, students' reflective writing, and

interviews. Lesson procedures are attached as an appendix to introduce how the social justice lessons were actually implemented.

The fourth chapter presents findings from class discussions, students' artifacts, and interviews in relationship to the three research questions. The results are categorized according to the research questions.

The fifth chapter includes a discussion of the findings. Findings are discussed through a comparison of prior research. When interpreting results, my personal voice and views are added from seeing the results. Limitations of this research and suggestions for further study are also included.

CHAPTER TWO: LITERATURE REVIEW

Overview

Theories and research in social justice education are examined in the chapter. To provide a logical development of the need for this study from supporting educational theories, I began with investigating various concepts of social justice to develop my own definition of social justice. Three types of oppression are also explained to help understand social justice better. Details of social justice education are then reviewed.

In addition, I explore characteristics of privileged people and anti-oppressive education to develop a need for research in teaching for social justice with students from privileged groups are explored. Prior research on privilege and social justice is also reviewed.

Then, research and theory in cognitive development are reviewed. By discussing developmental appropriateness of teaching for social justice with middle school students, it is expected this study is considered both theoretical and practical.

Additionally, the works of Frankenstein (1983, 1987, 1990), Skovmose (1994), and Gutstein (2003, 2006a, 2006b, 2007a, 2007b) to support teaching mathematics for social justice are investigated.

In summary, the combination of three theoretical backgrounds explains why this study should be conducted: Teaching for social justice with students from privileged groups, teaching for social justice with middle school students, and teaching mathematics

for social justice. These three concepts helped me develop research questions and guided me to conduct this study.
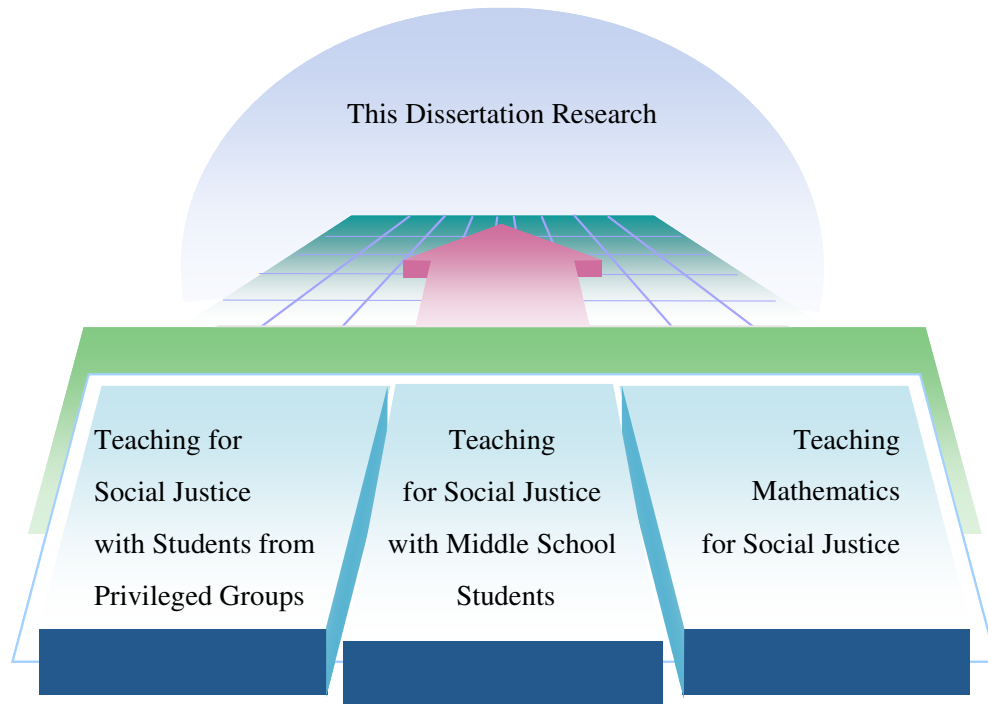
Figure 1. Conceptual Framework of Literature Review

Social Justice Education

This section begins by reviewing various definitions of social justice in order to develop my own definition of social justice, which is a foundational theme of this study. After, three types of oppression (racism, classism, and sexism) are explained to show how the three prevent social justice in society to occur. Information is provided to explain

social justice education, such as a definition, theoretical background, methods of lesson development, and principals for practice.

Definitions of Social Justice

In this section, various definitions of social justice by different authors are introduced, as well as my own definition of social justice based on a cumulative understanding of prior definitions.

As society becomes more multicultural, issues such as social equity, equal opportunity, and diversity have been regarded as important concepts and are discussed among diverse peoples (Au, Bigelow, & Karp, 2007). In this multicultural context, the term "social justice" is also increasingly used. Social justice provides an opportunity to engage with the issues in a multicultural society (Lipman & Monkman, 2009).

Researchers use social justice in various ways, so it is essential to review concepts which have been used. In one sense, social justice is a concept which provides significance to life through dialogue on issues of equality and fairness (Archer, 2007).

First, social justice is both "a process and a goal" (Bell, 2007). Griffiths (2003) also supports this definition and considers it an on-going process, which is never finished or completed. It is a project that cannot be achieved at once, but if achieved, all people benefit. It always needs to be discussed and constantly refined. Social justice contends that people from all groups in society can participate equally to realize all of their desires (Bell, 2007).

Gewirtz (2002) defines social justice through three dimensions: distributional justice, relational justice, and associational justice. Distributional justice is often used similarly with social justice and means a society where resources are distributed equitably. It also includes the meaning of justice as equal opportunity and justice as equality of outcomes. However, Gewirtz (2002) also states that the concept of a fair distribution of material and goods being a prerequisite for a just society, is limiting in its boundaries because distributional justice does not address issues of privilege such as power and wealth. Thus, Gewirtz (2002) introduces privilege in his definition of relational justice. Relational justice supports just and fair relationships in society (Archer, 2007). It also ensures cultural recognition and respect.

> One way of distinguishing between the distributional and relational dimensions is by thinking of them as rooted within two contrasting ontological perspectives. The distributional dimension is essentially individualistic and atomistic, in that it refers to how goods are distributed to individuals in society. By contrast, the relational dimension is holistic and non-atomistic, being essentially concerned with the nature of inter-connections between individuals in society, rather than with how much individuals get. (Archer, 2007, p. 141)

The third dimension is associational justice, which means people take part in decision-making processes related to their community (Gewirtz, 2002). Associational justice gives people equal opportunities to participate in their community. According to Gewirtz (2002), these three dimensions of social justice cannot stand alone; they complement each other. This characteristic of social justice is based on relationships among three

dimensions, which makes teaching for social justice complicated. However, it helps people identify different sorts of equity issues (Archer, 2007).

Morales (2005) defines social justice as a stepping stone to bring about the transformation of society.

> Social justice is about improving the human condition through knowledge, reflection, and action. It is about raising individual and collective social consciousness to examine the consequences behind seemingly placid ideas. It ignites a passion in people to tear down social walls and challenge injustices by taking action against oppressive social structures. (p. 21)

People in a socially just society put more emphasis on everyone's well-being as opposed to individual well-being. Thus, social justice ultimately seeks "harmonious coexistence" among a diverse people (Morales, 2005).

Based on definitions of social justice by Griffiths and Gewirtz and their integration into Morales's definition of harmonious coexistence, my definition of social justice is an essential process of equal access to material and participation through collaboration between diverse peoples for the benefit of all.

Oppression

To understand social justice, various types of oppression also need to be clearly defined to help students recognize societal issues. Generally, racism, classism, and sexism represent types of oppression in a multicultural society. Under each type of oppression, Goodman (2001) classifies people from different groups in the United States

into two categories: dominate group and subordinate group. Goodman (2001) states that males in regard to sexism, whites in regard to racism, and people from middle and upper classes in regard to classism belong to the dominant group.

Table 2-1

Oppression Chart

Types of Oppression	Dominant Group	Subordinate Group
Sexism	Males	Females
Racism	Whites (People of European descendent)	People of color (People of African, Asian, Latin American, Native American descent); biracial/multiracial people
Classism	Middle and upper classes	Poor and working classes

(Goodman, 2001, p. 8)

Sleeter and Grant (1999) explain that the current social system helps maintain oppression:

The structuring of social institutions for the benefit of dominant groups results in racism, sexism, and classism. As neo-Marxist sociologists point out, the capital economy structures in great wealth differences and enables the class that controls production to maintain and extend its wealth. A few individuals may gain economic mobility, but the lower and working classes as a whole do not. However, because some people do become upwardly mobile, and because most

people seem to act like autonomous individuals, the class system is made to seem

fair. (p. 194)

Members of the dominant group are people who have political, economic and social

power in a society. Therefore, their decisions can influence the lives of people from lower

classes (Kallen, 2004). However, it seems that people in the dominant group do not

utilize their power toward a socially just society. Instead, the dominant group hides

inequities and inconsistencies built in the power structure, and tries to make subordinate

populations believe that they can achieve upward mobility by following the rules and

norms (Goodman, 2001). Educators need to help students recognize types of oppression

to prevent them from persisting in society for the benefits of all.

Racism

Race refers to the arbitrary classification of human population, and its main

criteria are biological differences such as skin color, hair, and facial shape. Racism

involves the belief that a particular race is superior to the other races; it is a consequence

of economic, political and social imbalance (Kallen, 2003). This imbalance sacrifices

some ethnic groups. Racism pervades all other systems in society.

There are two important themes people should be aware of. First, racism,

generally known, distresses the targeted people and at the same time, it does ethical

violence to the people themselves in the dominant group (Bell, 2007). That is why

dominant people come to acknowledge years later that their violence hurts targeted

people and may find their former behavior to be abhorrent. People may be familiar with

the prior statement of distressing the targeted people, but many people tend not to recognize the next effect on the dominant group. Racism is a systemic oppression that negatively impacts both the dominant group and the dominated groups (Guy, 2008).

The second important issue is that people sometimes cannot recognize when racism takes place. Some people consciously segregate others with their own prejudice and racial preference (Bell, 2007). However, some people unconsciously assume cultural norms for white people are the mainstream standards. Therefore, finding norms which exist but are not always obviously detected, is important to eliminate racism.

Classism

Classism is the type of discrimination towards people in poverty and people whose access to resources is controlled by a dominant group. Economic status places people into different classes. People usually misunderstand that they belong to a middle class, even though they do not benefit from any middle class privileges. This misconception comes from the situation where wealthy people set up the norms and everyone else accepts them without any doubt (Bowles & Gintis, 1987).

Classism currently has a broad sense of meaning in a global society. Due to globalization, the power of capitalism permeates almost every place in the world (Gabbard, 2008). Globalized capitalism produces discrimination between countries, so the power of classism can keep perpetuating itself (Leistyna, 2008).

The question as to whose interest has more power in social systems is an important analytical tool to scrutinize various discriminations under classism (Bell,

2007). Who benefits? Who is penalized by the social structure? These types of questions can probe society and help people identify hidden hierarchies, which allow classism to continue unopposed.

Sexism

Sexism usually refers to discrimination toward women based on the idea that men are superior to women. Historically, sexual and reproductive functions have limited women's roles in society. On the other hand, men are mainly regarded as active beings to set up cultures. This situation influences positions of women, and so puts them into lower socioeconomic status.

Additionally, women are major subjects of violence, such as rape and battering. For example, women were treated worse than men by invaders in the past. This fact gives women less freedom and restricts their actions. Therefore, women have historically and systematically been prevented from holding as important roles as men have.

The feminist movement supports achieving equality with men, challenges the stereotypes of gender roles, and confronts various types of violence toward women (Weiler, 2008a; 2008b). Feminists have been trying to deconstruct the social structure that sustains a patriarchic society. Also, the feminist movement helps raise women's critical consciousness by reflecting on their experiences, such as their roles at home and work (Adams, 2007). In these attempts, some men helped feminists in their struggle. The men broke down some of the obstacles such as reproductive functions preventing women from being treated as equal to men. In addition, some men helped women overcome

continuing limitations such as the glass ceiling, which had been perpetuated by the hidden hierarchies.

Definitions of Social Justice Education

Bell (2007) defines social justice education as a set of interdisciplinary and interactive pedagogical procedures. Students analyze various types of oppression in order to understand "the meaning of social difference and oppression both in the social system and in their personal lives" (Bell, 2007, p. 2). Ultimately, social justice education enables students to develop critical lenses to find oppression in their world and to change the oppression with the analytical tools gained from social justice education. This process is called developing "a sense of agency" (Gutstein & Peterson, 2005). A sense of agency means the gradual progress in students' growth; it does not mean all or nothing.

According to Freire (1998),

Students, as they are increasingly posed with problems relating to themselves in the world and with the world, will feel increasingly challenged and obliged to respond to that challenge. Because they apprehend the challenge as interrelated to other problems within a total context, not as a theoretical question, the resulting comprehension tends to be increasingly critical and thus constantly less alienated. Their response to the challenge evokes new challenges, followed by new understandings; and gradually the students come to regard themselves as committed. (p. 62)

Students with a sense of agency strongly believe they can create a society where people make a difference, and transform these communities to make them better, regardless of institutional discrimination. The important point here is not merely to involve students who are already marginalized; it is to change society so that all people are included (Kallen, 2004).

Theoretical Background of Social Justice Education

The pedagogical approach of social justice education is often connected with Freire's work. Freire had been a big advocate of liberative education, whereby he helped people around the world understand and practice it since the 1970's. Freire (1998) considers education as the practice of freedom, which opposes education for the practice of domination. Education should aim to serve people's struggles pursuing humanity and liberation from oppression. Supporting this pedagogy, Freire (1998) encourages teachers to develop problem-posing pedagogies, which are critical for education to "strive for the emergence of consciousness and critical intervention in reality" (p. 62). Freire (1998) goes on to say,

> Problem-posing education, as a humanist and liberating praxis, posits as fundamental that the people subjected to domination must fight for their emancipation. To that end, it enables teachers and students to become subjects of the educational process by overcoming authoritarianism and an alienating intellectualism; it also enables people to overcome their false perception of reality. The world - no longer something to be described with deceptive words -

becomes the object of that transforming action by men and women which results

in their humanization. (p. 67)

Students are exposed to problems which are related to themselves in the world through

the problem-posing pedagogy (Freire, 1998). Social justice education challenges students

so they become empowered and can respond to those problems in their world. This

empowerment also allows students to criticize the problematic world and make an effort

to change it.

How to Develop Social Justice Lessons

Even though there are increasing numbers of educators who are interested in

social justice lessons, it is not easy to find guidelines on how to develop lessons to teach

for social justice. This section introduces a way to develop social justice lessons for

educators who are curious about where to start and the process of development and

implementation.

First, it is important for educators to figure out which concepts in a subject area

they would like to teach and to choose social issues related to the concepts which could

help students learn better (Murrey & Sapp, 2008). In this step, it is good to talk to

students about possible topics and find what types of social issues students are currently

interested in their school, community and society, because educators can have students

more involved in social justice lessons if they adopt social issues which students are

willing to explore.

The next step in developing a social justice lesson is to find standards (Murrey & Sapp, 2008). Teaching for social justice does not mean that it only emphasizes educating students to help them develop critical lenses toward oppressions and a sense of agency. It should also put importance in helping students learn content standards and show appropriate academic outcomes according to each grade level. For this reason, educators need to find content standards and use the resources available. Each State Department of Education provides state content standards by subject areas and grades. In addition, professional organizations such as the National Council of Teachers of English, the National Council of Teachers of Mathematics, the National Science Teachers Association, and the National Council for the Social Studies present curriculum standards at their websites.

Third, teachers must set the unit standards and social issues which would be discussed with students (Murrey & Sapp, 2008). In this stage, it is critical to find data which are related to the selected standards and social issues. In addition, the data should not only help students learn the standards, but also have students actively involved in discussion. Various types of data can be collected such as video clips, writings, graphs, statistics, and pictures. Educators then need to arrange chosen data showing social issues with content standards accordingly.

Finally, educators begin a lesson by introducing the social issues in order to get students interested in a social justice lesson (Murrey & Sapp, 2008). It is important to start with objectives in the unit and teach students to learn content standards selected for

the lesson. This is the reason why understanding standards can help students to deeply investigate social issues.

Principles of Practice for Social Justice Education

The process of teaching for social justice helps students understand social issues, reflect on them using their prior beliefs, create questions about the issues, and analyze them (Adams, 2007). When practicing social justice education, there are a few principles which educators need to consider.

First, teachers need to provide all students with a safe and comfortable classroom environment to help them engage in the dialectic learning process (Adams, 2007). Emotional components in learning are as important for students as the cognitive components. The teacher should also instruct in the ideal types of communication for class. During the discussion, blaming other students and judging each other can prevent all students from having a productive conversation. Second, dialogue should start with students' reflections on issues (Adams, 2007). If the teacher poses problems and tries to interrupt with his/her own personal ideas, the teacher ignores the students' ideas and some students may feel alienated. As teachers may have the power to influence students' ideas, it is important to listen to their own ideas without guiding them. Finally, teachers need to be aware of the different levels of understanding for each student (Adams, 2007). Some students will only become aware of social injustices, while others will have a strong desire to address social problems and try to change themselves and those around

them. Therefore, teachers need to understand and respect their students' level of understanding and awareness of social problems.

In summary, these principles of practice for social justice education help students become active participants and learners in their classes and respectful of other's opinions. They also help students to be careful when responding to each other and when understanding each other's mistakes.

Teaching for Social Justice with Students from Privileged Groups

Based on my definition of social justice, "the essential process of equal access to material and participation through collaboration between diverse peoples which benefits all of them," I suggest that teaching for social justice with privileged students is important. In this section, the characteristics of privileged students by utilizing Goodman's (2001) theory are described. Then, types of anti-oppressive education by Kumashiro (2002), which supports my claim that educating privileged students is important is shown. Finally, prior research on privilege and social justice to confirm the need for this study is reviewed.

Characteristics of Privileged People

It is known that people from privileged groups are rarely aware of their privileged status and that people from disadvantaged groups are suffering in the places where privileged people cannot see (Goodman, 2001):

This lack of awareness relates to being the norm and therefore not needing to

think about one's social identity. It's like being a fish in water – when one is

surrounded by water as part of one's natural environment, it's hard to be aware of

it. This water has been filtered through the dominant ideology. People from

privileged groups are surrounded by their culture and, therefore, they don't notice

it. People from privileged groups tend to see themselves as unique individuals

who succeed or fail on the basis of their own merit. (pp. 25-26)

In addition, people from privileged groups tend to ignore injustices and resist

challenges to the status quo for two reasons: the risks and the lack of benefits. People

within the dominant group who attempt to correct injustices may be confronted or

harassed by other members of their dominant group (Goodman, 2001). At the same time,

they think they may lose something from their privileged status if they open veiled

aspects of the system from which they take advantage.

To conform to my definition of social justice, these characteristics need to be

converted to benefit everyone in a society through education.

Anti-Oppressive Education

Anti-oppressive education starts from the idea that education should improve its

quality through challenging various forms of oppression (Kumashiro, 2000). Kumashiro

(2002) states his perspectives, which are related to privilege and oppression through anti-

oppressive education.

Kumashiro (2002) presents four ways to teach anti-oppressive education: Education for the Other, Education about the Other, Education that is critical of privileging and Othering, and Education that changes students and society. The term Other refers to people who are marginalized in society, such as students of color and females. Anti-oppressive education is briefly introduced because it is similar to social justice education in many ways. In addition, each of the four ways to teach anti-oppressive education provides methods to work against discrimination and oppression and to work toward justice. However, "Education that changes students and society" is not discussed because its view is duplicated with social justice education.

Education for the Other

This idea helps minority students understand which systematic processes have marginalized them (Kumashiro, 2002). There are two different ways to observe oppression in schools. First, schools are the places where minority students are not treated well. In addition, teachers and administrators sometimes do not fulfill their roles to make a good learning environment for the Others and to provide a good education. The situations make a school environment harder, so students become more marginalized.

Having biased assumptions about the Other is another form of oppression in school. This prejudice can influence what is expected of the students. For example, there are typical expectations for students' behaviors and communication styles, which are based on the students' ethnicity and gender. Due to this prejudice, some students try to change the way they behave and talk to fit into mainstream culture (Kumashiro, 2002).

To improve the harmful environment, Kumashiro (2002) recommends educating teachers to be more culturally responsive. According to Villegas and Lucas (2002), "education for the Other" can provide future educators with an opportunity to have a strong insight into teaching and learning in a multicultural society, and guide future educators to integrate students' backgrounds into curriculum (Sleeter, 2001).

Education about the Other

This approach provides both majority and minority students with an opportunity to learn about the Other (Kumashiro, 2002). "Education about the Other" is discussed in detail because it explains why educating privileged students is also important in the social justice education paradigm.

Kumashiro (2002) explains that there are two kinds of oppressive knowledge. The first type of knowledge is a set of information which is known as the standards in a society. According to Kumashiro (2002), a misconception takes place in this case:

Otherness is known only by inference, often in contrast to the norm, so some partial knowledge often leads to misconception. For example, learning that white New England settlers and their descendants are the authentic Americans implies that people of color are not real Americans. (p. 39)

It could also be offensive to students of color if they feel they are not authentic Americans.

The second type of knowledge is the knowledge that is distorted and formed by stereotypes about the Other (Kumashiro, 2002). For example, students unconsciously

learn about popular culture, gender roles, and stereotypes; the bias towards the Other is also accumulated through this process.

Schools systematically perpetuate these types of knowledge because contents in curriculum continue to spread distorted knowledge. Kumashiro (2002) points out that "students learning what is already known or is becoming known can never tell the whole story, especially since there is always diversity in a group, and one story, lesson, or voice can never represent all" (pp. 42-43). In addition, most students accept the distorted knowledge without even noticing it within the school curriculum. Kumashiro (2002) asserts that education, which addresses the two types of knowledge above in order to save students from learning misinformation, is required. This approach can help students view knowledge critically and eventually understand the Other better.

The importance of this approach towards privileged students, particularly in reference to anti-oppressive education, will ultimately help them develop a better understanding of the Other.

> The strength of this approach is that it teaches all students, not just the Othered students, as it calls on educators to enrich all students' understanding of different ways of being. By increasing students' knowledge of the Other, and perhaps helping students see similarities between groups, this approach challenges oppression by aiming to develop in students an empathy for the Other. (Kumashiro, 2002, pp. 41-42).

I believe Kumashiro's "Education about the Other" can provide a good theoretical background for this study. Students from privileged groups can have new chances toward

learning about people different from themselves. The learning opportunity in this study will help students from privileged groups understand the Others and develop empathy for them.

Education that is Critical of Privileging and Othering

This type of anti-oppressive education helps students identify why some people keep being privileged and how this is perpetuated. For example, females usually struggle with sexism and social structures which favor male workers (Kumashiro, 2002). In addition, minorities sometimes do not show good achievement in the school because of cultural difference and "economic, racial, and other structural barriers to educational persistence and success" (Kumashiro, 2002, p. 45). Furthermore, the school curriculum usually spreads the knowledge which is considered as common in society, and this paradigm contributes for maintaining the current ideology (Bahruth, 2008).

To implement this type of anti-oppressive education, Kumashiro (2002) suggests teaching educators first, then they teach students how to recognize oppression in a current society and education. With this perspective, "education that is critical of privileging and Othering" will help students investigate the sociocultural mainstream structures and find various types of oppressions in it.

Research on Privilege and Social Justice

Prior research demonstrates social justice education can bring about changes even though the social problems are not related to the students' lives. Tatum (1994) conducted

related research about teaching racism to white students. In her class, white college students were introduced to white people who had contributed to liberate African Americans. The students' first reaction, after they were exposed to exemplary white people who helped African Americans' liberation, was in the same context with Goodman's ideas. Students were afraid of exposing inequality issues due to isolation from their close friends. However, they eventually developed different perspectives and understanding on people of color and wanted to be activists to help them regardless of past fear of isolation. Some students were eager to fight discrimination and even saw themselves as taking part in rallies for people of color. Before this discussion on racism, students were unaware of the needs of people of color, because prior to that exercise, students never had to interact with them on a personal level.

Martin Luther King, Jr. says, "Freedom is never voluntarily given by the oppressor; it must be demanded by the oppressed." However, if the oppressors help the oppressed have freedom, it would be easier than the situation of only the oppressed striving to achieve freedom. Through teaching for social justice with students from privileged groups, I believe socially disadvantaged groups can receive more caring and justice from their community.

Teaching for Social Justice with Middle School Students

There are two reasons why educating middle school students for social justice is important. First, their intellectual development is now appropriate for social justice

education. The other reason is that they are also at a critical stage in which their development of moral sense will influence their future decision-making.

Developmental Appropriateness

Teaching for social justice for middle school adolescents is ideal in that students from that age group are developmentally capable of engaging in complex issues of social justice (McDaniel, Ríos, Necochea, Stowell, & Kritzer, 2001). While children in early childhood can understand concrete problems, they cannot perform the logical and abstract thinking required to fully comprehend a complex issue like social justice (Driscoll, 2005). They also cannot think about all the possible outcomes to support the logic (Berk, 1996). This idea is supported by Piaget's theory of cognitive development.

There are four stages in Piaget's theory of cognitive development: Sensorimotor (birth to 2 years), Preoperational (2 to 7 years), Concrete Operational (7 to 11 years), and Formal Operational (11 years onward) (Driscoll, 2005). The biggest gap before the Formal Operational stage is the children's lack of logical thinking processes, nor can they reason theoretically. In addition, children at this age cannot consider the perspectives of others. Piaget believes that children's thinking in the Formal Operational stage is as powerful as adults' thinking and reasoning, even though children's thinking and knowledge sometimes needs to be revised.

Propositional logic is the hallmark of formal operations. That is, operations become more abstract so that the individual can reason, not just with objects, but with formally stated premises or propositions. This enables children not only to

think hypothetically, but to plan a systematic approach to solving problems.
(Driscoll, 2005, p. 197).

Children in the Formal Operational stage also become metacognitive, meaning they are aware of their own thinking (McDaniel et al., 2001). Children in this stage recognize that knowledge is constructed by people and that knowledge is relative. Therefore, it is possible to say that teachers can implement social justice education for young children in middle schools. They are intellectually mature enough to have their own opinions on phenomena and to consider other people's perspectives and situations (Selman, 1980).

> In short, young adolescents are cognitively capable of reasoning about the reality and ideal of social justice, of thinking about why/how they come to that reasoning, and of judging whether that reasoning is helpful/accurate for a specific situation. (McDaniel et al., 2001, pp. 29-30)

The maturity levels of middle school students' intellectual development support social justice education for middle school students.

Moral Development

Social justice education is critical for students to develop important values such as compassion, consideration, respect, and care. These values are essential to peacefully coexisting citizenry. Middle school students are an excellent population for social justice education because they are in the process of developing a sense of morality and justice. They are also willing to work against discrimination (McEady-Gilliad, 1994). In addition,

middle school students want to work to discuss and break down types of privileges if they are aware there is an injustice in society (Quintana, 1998).

In addition, middle school students are at a critical stage in their lives (Manning, 1994). They are developing abilities of moral judgment which they can use to handle conflicts and injustice. At the same time, they can recognize their identity of class, gender, and ethnicity. Their awareness of themselves can help them see the real world. This process potentially influences their moral decisions and behavior in the future (Manning, 1994).

Teaching Mathematics for Social Justice

In this section, theories with critical approaches in mathematics education are introduced. Using the ideas of Frankenstein and Skovsmose, I discuss the reasons why mathematics education should help students raise awareness on social issues. In addition, Gutstein's work based on Freire's theory is investigated to provide more information in teaching for social justice.

Critical Mathematics Education

Researchers, such as Frankenstein (1983, 1987, 1990) and Skovsmose (1994), have been writing about the role of mathematics and its connections to critical theory. Critical mathematics education has provided a basic framework for the term "teaching mathematics for social justice" by Gutstein (2003, 2006a, 2006b, 2007a, 2007b), which is elaborated on in the following section.

Frankenstein (1983, 1990) integrates Freire's critical pedagogy into mathematics education. She (1987) believes that the teaching of mathematics can help students raise their critical awareness through quantitative reasoning. In addition, Frankenstein (1990) asserts that mathematics can promote social justice by asking mathematical questions related to social issues and sharing the data with the others to raise awareness on social issues.

Similar to Frankenstein's views of critical mathematics education, Skovsmose (1994) uses the term "mathemacy." The concept of mathemacy has a close relationship with critical literacy by Giroux (2001), who defines it as the process where students investigate their own experiences and engage in dialogue with other people. He argues that people should pay attention to the politics surrounding them and characterize their interactions in the world. Critical literacy is the counter-concept to functional literacy, which perpetuates the dominant groups in society. Within this concept of functional literacy, literacy has close relationship with economic success. People tend to put more emphasis on knowledge that is useful in the job market. This situation can lead people only to accept knowledge available in a given society and subsequently lose the power required in critical thinking.

Mathemacy means more than just solving numeric problems. It also means organizing data and writing proposals for political reforms to bring about social changes (Skovsmose, 1994). Skovsmose (1994, 1998) believes that mathematics education should guide students to develop critical understanding because mathematics has an important role in our current society: It is a source for decision making and action. When educators

teach students mathematics to help students become critical thinkers, then mathematics can become an important tool for democracy. For example, music school students in Denmark collected data regarding school finance (Skovsmose, 1998). Their school was not financially supported by the Government, even though music schools in another area got funding from local authorities. Students thought this isolation was against democracy. They compared results utilizing their mathematical knowledge after making budget sources differently. This data was used in a discussion between the students and the Mayor of the city when he visited the school.

Teaching Mathematics for Social Justice

Gutstein introduces "teaching mathematics for social justice." According to Gutstein (2006a), there are "two sets of pedagogical goals" regarding teaching mathematics for social justice: Social justice pedagogical goals and mathematics pedagogical goals. These two sets of goals have important roles in the dialectical learning process. Gutstein (2006a) lists three goals under social justice pedagogy: Reading the world with mathematics, writing the world with mathematics, and developing positive cultural and social identities. Under mathematics pedagogy, there are reading the mathematical word, succeeding academically in the traditional sense, and changing one's orientation to mathematics. Through these six goals, Gutstein explains teaching mathematics for social justice is not the simple practice of engaging students in the class with social issues. Instead, teaching mathematics for social justice is important because it can make changes in their lives with real-life applications of mathematics.

For the first set of pedagogical goals, the social justice pedagogical goals are universal, so that educators can apply certain principles no matter what they teach. The only reason why there are different types of instructional practice is that there are different fields of study.

<u>Reading the World with Mathematics</u>

Gutstein (2006a) defines this term as "understanding the sociopolitical, cultural-historical conditions of one's life, community, society, and world" (p. 24). Reading the world is the term originally used by Freire (Freire & Macedo, 1987, as cited in Gutstein, 2006a). It has a close relationship with learning to read the word. The important fact to recognize at this point is that people should learn to read the world first. It means people should reflect on their lives through political lenses. People can read and write after they have critical consciousness and awareness as below.

The idea of reading the world then applies to mathematics. Gutstein (2003, as cited in Gutstein, 2006a) defines it below:

> ...to use mathematics to understand relations of power, resource inequities, and disparate opportunities between different social groups and to understand explicit discrimination based on race, class, gender, language, and other differences. Further, it means to dissect and deconstruct media and other forms of representation. It means to use mathematics to examine these various phenomena both in one's immediate life and in the broader social world and to identify relationships and make connections between them. (pp. 25-26)

Students begin to read the world with mathematics when they have both the data and their implications in their lives. Gutstein (2006a) uses an example of the B-2 bomber and its value, which is equivalent to the cost of four-year college scholarships for a couple thousand students. He points out that the price itself might not be meaningful to students, until they can see it in perspectives to their lives. However, once students can see themselves and their future, it can become meaningful.

Writing the World with Mathematics

This goal also originates from Freire's work (Gutstein, 2006a). Writing the world is as important as reading the world, because it is an essential process of action which people should take after they become critically aware of the world around them. Writing the world with mathematics is "using mathematics to change the world" (Gutstein, 2006a, p. 27). Gutstein (2006a) views it as "a developmental process of beginning to see oneself capable of making change and a sense of social agency" (p. 27). Through this process, students start taking actions and advocating for social change.

Reading and writing the world are separable processes that also have an interdependent relationship in the larger context for attempting to make social changes (Gutstein, 2006a). Reading the world precedes writing the world. Students develop awareness through reading the world and then develop a sense of social agency through writing the world. However, there is no clear boundary between them. Students can develop their sense of agency through reading the world, and, at the same time they can deepen their understanding of social problems through writing the world.

Developing Positive Cultural and Social Identities

According to Gutstein (2006a), this goal posits that "students are strongly rooted in their home languages, cultures, and communities, but at the same time, can appropriate what they need to survive and thrive in the dominant culture" (p. 28). This statement is similar with the concept of "cultural competence" which means students understand and respect their own cultures (Ladson-Billings, 1995, as cited in Gutstein, 2006a).

One important issue in this goal is how much teachers can help students develop their cultural identities when their cultural backgrounds are not the same as the teachers' backgrounds. There are still different approaches and arguments to observe in this matter. Ladson-Billings concludes in her research that the teacher's ideology and philosophy are major factors influencing how much the teacher is successful in teaching students (1994, as cited in Gutstein, 2006a). Therefore, it is not always true that teachers from an ethnic minority can only teach minority students. In addition, Darder (1997, as cited in Gutstein, 2006a) proclaims that the teacher's ideology and academic preparation are as important as the teacher's cultural background in social justice education. On the other hand, Gutstein (2003) addresses these issues by emphasizing that teachers need to understand their students' backgrounds, cultures, and communities, as well as the teachers' own cultural identity, ideology, and personal experience with a minority student population.

The "mathematics pedagogical goals" described above are more mathematics-learning oriented than the social justice pedagogical goals. However, they are still interdependent with social justice pedagogical goals.

Reading the Mathematical Word

To achieve this goal, it is important for students to develop a mathematical understanding and power (Gutstein, 2006a, p. 29). There are a few reasons why this goal should be achieved for social justice education. First, it gives students the power to figure out and understand important social issues. The ability to read the mathematical word is essential to students' ability to understand the world through mathematics. Second, students need the tools to make the changes they want to see in society (Gutstein, 2006a). Students can use mathematical knowledge as an effective tool to make these changes.

Succeeding Academically in the Traditional Sense

Succeeding in the traditional sense means that "students achieve on standardized tests, pass high school, succeed in college, have access to advanced mathematics courses, and pursue mathematics-related careers" (Gutstein, 2006a, p. 30). When students demonstrate academic success in the traditional sense, it can provide them greater possibility of achieving economic success.

Also, many students from subordinate groups, such as students of color, working class students, and female students, struggle to achieve high scores on national assessments, including standardized tests such as the ACT and SAT (Lubienski, 2007). From the social justice perspective, this is a critical problem.

<u>Changing One's Orientation to Mathematics</u>

Gutstein (2006a) explains that students do not think there is relationship between mathematics and their lives. To change one's orientation to mathematics, Gutstein (2006a) contends that the mathematics curriculum needs to be reformed to make explicit connections between students' lives and mathematics. These reforms would help students better explore and understand their lives using mathematical knowledge. Students will benefit from this learning activity and perceive that mathematics is an important tool for investigating their world.

Prior Research in Teaching for Social Justice

Social justice has been used as a research topic in many areas. Reviewing the prior research on social justice can help researchers not only figure out what has been accomplished, but also determine what else needs to be completed in the future. Review of research in this section was conducted two ways. First, prior research in teaching social justice was introduced. Then, I specifically investigated research in teaching for social justice in the mathematics area.

<u>Research in Teaching for Social Justice</u>

Prior research shows that research regarding teaching for social justice has been conducted in different subject areas and grade levels (Ayers, Quinn, & Stovall, 2009). Teachers not only use a single subject to teach for social justice, but also use interdisciplinary approaches (Wade, 2007). The effectiveness of these subjects to increase

students' perspectives of diversity will provide the impetus for their inclusion in curriculum.

The subject of social studies is a popular area in teaching for social justice (Wade, 2007). Many related issues such as civil rights, multiculturalism and democracy are included in social studies, which are possibly good sources to teach for social justice (White, 2008). For example, students discuss what they know about the Civil Rights Movement first and read a book about it. After they finish reading the book, they reflect on and write about the book and what they learned. The teacher also introduces stories, films, and songs related to the lesson. This type of lesson can introduce social issues to students, but the teacher needs to show examples of how struggles like the Civil Rights Movement still exist. Through this process, students can learn more about the complex issues in our current society.

Science is also used to teach for social justice. According to Barton (2003), students use science "as a tool for generating personal change and community change" (p. 120). For example, students build a community garden using their knowledge of science and find that their involvement in their community made the community better than before (Barton, 2003). Learning activities such as studying the quality of soil, researching plants, and planting were used to build a community garden. By doing those activities, students acknowledged they could make a difference in their community.

Social justice education also influences undergraduate programs. In an effort to help undergraduate students find existing social constraints and work for changing them, college programs have started to include coursework promoting social justice (Haberman

& Post, 1992). For example, Van Soest (1996) found that the undergraduate course on societal oppression in social work education encouraged students to commit to social justice. The content in the course focused on (a) prejudice on an oppressed people; (b) economic and political strategies by people from dominant groups to subordinate the oppressed; and, (c) strategies on how social work students can work for social justice (Van Soest, 1996). The survey results on students' beliefs about social justice from this course demonstrated they had a stronger desire to accept the ideology of a just world over the students who did not take the course. Students who had taken this course also demonstrated their commitment to social justice advocacy.

Literature classes at the college level also provide a forum for teaching for social justice. Students can look for oppression that is embedded in the literature such as personal narratives and life histories (Simon & Eppert, 1997). They can also read books which address social issues such as human rights, gender equity, class issues, and issues of racial justice. The examination of oppression in literature gives students opportunities for imaginative engagement and developing a sense of agency and responsibility (Elasser & John-Steiner, 1987; Fiore & Elasser, 1987). In addition, students can take part in movements for social change through participation in discussions about social problems (West & Currie, 2008).

Research in Teaching Mathematics for Social Justice

This section introduces prior research related to teaching mathematics for social consciousness. There are three representative examples of teaching mathematics for

raising critical awareness: The critical mathematical literacy project (Frankenstein, 1983, 1987, 1990), the Algebra Project (Moses & Cobb, 2001a, 2001b), and the research in a Chicago Public school with Latino/a students (Gutstein, 2003, 2006a, 2006b, 2007a, 2007b).

Critical Mathematical Literacy

Frankenstein (1990) conducted a study with her working class college students. The lesson plan for her study was developed to help students observe social issues, such as issues of gender and ethnicity, with regard to mathematics. Students analyzed statistical information about the issues and solved mathematical problems in groups. According to Frankenstein (1989), students often considered discrimination as their personal problem instead of thinking it was an institutional problem. Through this study, students acknowledged mathematics as a tool to find discrimination in society.

The Algebra Project

Mathematical literacy is important for students to compete in the global economy (Moses & Cobb, 2001a). However, Moses found that socially disadvantaged students had been traditionally marginalized from mathematics education and even public education in general (Moses & Cobb, 2001a). He also found that in the classroom, students divided into different levels of mathematical ability according to their parents' socioeconomic levels when he taught algebra to middle school students. At the time, he had an idea that teaching algebra would give middle school students access to advanced mathematics

classes at the high-school level, and this opportunity could further assist helping them in preparing for college mathematics courses. By getting this chance, he thought socially disadvantaged students could break barriers and obstacles and become competitive citizens.

The Algebra Project had immediate impacts on teaching mathematics nation-wide. Many educational institutions accepted the instructional methods of this project to help African American and Latino students increase their mathematical achievements.

The project originally proposed three goals (Silva, Moses, Rivers, & Johnson, 1990). The first goal, as mentioned above, was to teach mathematics to middle school students and help them prepare for high-school level classes. The second goal was to use students' experiences in their lives as instructional sources, because students were more interested in learning mathematics when they found something familiar to themselves. The last goal was to collaborate with parents to develop a mathematically inclined community. Parents, who participated in their children's mathematics education every semester, wrote a statement of how well they expected their children to achieve.

The theoretical background of this project was based on the Civil Rights Movement in Mississippi (Moses & Cobb, 2001b). Moses used a similar approach to the one used to explain the importance of voting to African Americans of Mississippi in the 1960s. Moses and Cobb (2001b) found a similarity between learning mathematics and the right to vote. They believed mathematical literacy enabled students to have access to economic success, and the right to vote enabled African Americans in Mississippi to have access to political representation and opportunities for obtaining their human rights in

society. The Algebra Project is important in describing that it tries to understand mathematics education with connection to equity issues.

Research in a Chicago Public School with Latino/a Students

This project was conducted by Gutstein (2006a; 2006b; 2007a), who was a strong advocate and an emerging educational researcher of mathematics education for social justice. Gutstein (2006a; 2006b; 2007a; 2007b) contends that students should learn mathematics to develop critical awareness on events around them. Using the social justice approach to teach mathematics can help increase students' achievements in mathematics. Through this research, Gutstein (2007b) found that students learning mathematics and building consciousness of societal issues were complementary processes.

The importance of this research is to apply "a series of real-world mathematics projects in which students investigated racism and other injustices using mathematics as a key analytical tool" (Gutstein, 2007a, p. 426). For example, students were asked to solve mathematics problems that related to their community (a house price in their community and average Latino householder's annual income) and asked to figure out the underlying meanings and possible effects of it, (eg. could a Latino family afford a house in the community? If so, how much of a house payment could the family afford?). As a result, students benefited both mathematically and socially from engagement in the learning activities (Gutstein, 2006a; 2007a).

Most students also showed increased academic performance in mathematics on tests after participating in the project. In addition, their abilities of mathematical reasoning had developed enough for them to explain the processes they used to reach conclusions. Finally, students found mathematics as a useful and practical subject area, which they could use for their real lives (Gutstein, 2006a; 2006b; 2007a).

Conclusion

Prior research demonstrates that teaching for social justice with students from socially disadvantaged groups has been done before. This type of instruction allowed them to recognize their social status and help strive to seek equality. However, what has not been studied is to teach mathematics for social justice with students from privileged groups.

With the supporting theoretical backgrounds, the research for my dissertation shows that learning opportunities of this type helps students create a strong desire for social justice. It is also possible that teachers can continually reinforce how supporting equality and diversity offers benefits to students and ultimately serves our collective well-being in the future.

CHAPTER THREE: METHODOLOGY

Overview

The research design and methodology of this study are explained in this chapter. It begins with presenting the reason why a case study design was chosen. Then, the school where the study took place is described. Next, I introduce the discussion questions in social justice lesson plans which helped students engage in dialogue on social issues is introduced. Following this is an elaboration of the five methods of data collection used to conduct my inquiry: Observations, students' reflective writing, interviews with students, my reflective journal, and video/audiotapes. Finally, my method of data analysis and criteria for trustworthiness are presented.

Research Design

In order to answer my research questions, qualitative measures guide the inquiry process because it focuses more on human interaction and observations in the classroom (Glesne, 2006). Merriam (2002) explains characteristics of qualitative research:

> The qualitative researchers strive to understand the meaning people have constructed about their world and their experiences…. Researchers gather data to build concepts, hypotheses, or theories. In attempting to understand the meaning a phenomenon has for those involved, qualitative researchers build toward theory from observations and intuitive understandings gleaned from being in the field…. The product of a qualitative inquiry is richly descriptive. Words and pictures

rather than numbers are used to convey what the researcher has learned about a

phenomenon. In addition, data in the form of quotes from documents, field notes,

and participant interviews, excerpts from videotapes, electronic communication,

or a combination thereof are always included in support of the findings of the

study. (pp. 4-5)

Participants' perspectives in qualitative research play an important role to help

researchers understand phenomena (Merriam, 2002). Students' perceptions of social

justice in this study were accumulated carefully and in depth by utilizing multiple ways

of interacting with them.

Under qualitative research, I employed a case study design. Creswell (1998)

suggests five different qualitative studies: Biography, phenomenology, grounded theory,

ethnography, and case study. Creswell (1998) describes a case study as:

... an exploration of a "bounded system" or a case (or multiple cases) over time

through detailed, in-depth data collection involving multiple sources of

information rich in context. This bounded system is bounded by time and place,

and it is the case being studied, a program, an event, an activity, or individuals. (p.

61)

This study is appropriate to be called a case study because the purpose of this study is to

investigate particular student population's understanding of social justice.

Setting

This research was implemented in a public charter school in a metropolitan city located in the Northern Rocky Mountain region. This school was founded in 1999 by educators and members of the community as the first charter school in the city. The school includes grades K-8 and new students are selected using a random lottery from the waiting list every year. Once students have been selected to attend they are granted continuing membership status.

Under the school's commitment toward developing future community leaders, Expeditionary Learning has been used as their school philosophy, which requires students to meet set curriculum guidelines in both academic and character development. Expeditionary Learning adopts interdisciplinary approaches to inquiry where all students are involved in activities such as field work, service, and presentations to achieve their intellectual understanding. At the same time, Community Based Curriculum (CBC) is also part of the school's unique program which provides various community activities. Through CBC activities, educators in the school expect students to appreciate that their community experiences are relevant with the classroom curriculum. Students also learn more about their community and the many efforts of people who support their community.

The aforementioned school was a good place to conduct this research. First, the mathematics curriculum, Connected Mathematics©, is a conceptually based foundational curriculum, so it can be a great asset to social justice mathematics teaching. This mathematics program encourages students to critique answers, question assumptions, and

justify reasoning. These were all important dispositions toward knowledge that teachers could integrate into their social justice pedagogy. Second, the student population in the school was suitable. The school is a public charter school and reflects a more dominant cultural group. It does not provide students with free/reduced lunch, one indicator of family income level, or school bus service. This implies it is the responsibility for parents to transport and prepare lunches for their children. There is no data available in the school to predict students' socioeconomic status (SES) level, but it may be assumed using the free and reduced lunch indicator of SES in school-based research that this student population predominantly belongs to a privileged group from the middle and upper class.

Discussion Questions

To answer three research questions under my inquiry, discussion questions were developed as below.

Using the tables and figures in the lesson plan of Class and Income (Appendix A), students answered these questions.

1. What are some reasons for different income levels?

2. What questions might a family in the lowest quintile have about a family in the highest quintile?

3. How might friends from the highest quintile feel about a friend who they learn is in the lowest quintile?

4. In what quintile do you think your family belongs?

5. Recently there has been a lot of discussion on the news about CEO bonuses in banks and companies which were recently bailed out by the government. What do you think about the CEO bonus debate? Should any CEO's get a bonus? If yes, under what conditions? If no, how would you reward a CEO who brings the company out of difficult times into a profit margin?

6. As a 7th grade student, do you think you can do something to change this problematic situation in the United States? If yes, what kinds of actions do you want to take?

Using the tables and figures in the lesson plan of Educational Attainment and Income (Appendix A), students answered these questions.

1. What do you think about this data? Is it reasonable for people with higher educational attainment to make more income than people with lower educational attainment? Why or why not?

2. How high of a degree do you plan to earn? Do the income levels in Table 2 influence your thoughts?

Using the tables and figures in the lesson plan of Gender and Income (Appendix A), students answered these questions.

1. Why is there a discrepancy of income level between males and females with the same educational attainment in Table 1?

2. (Females respond to these questions) How does this information make you feel? What solutions would you propose for addressing this discrepancy?

3. (Males only respond to these questions) How does this information make you feel? Should this discrepancy be protected? Why or why not? What solutions would you propose for addressing this discrepancy?

4. As a 7th grade student, what do you think you can do to change this discrepancy? In what ways?

Using the tables and figures in the lesson plan of Ethnicity and Income (Appendix A), students answered these questions.

1. What thoughts do you have about this information on income levels by ethnicity?

2. Why do you think there are differences of income levels between ethnic groups?

3. Thinking about the ethnicity of your parents, what are your thoughts about ethnic groups that make more income and ethnic groups that make less income?

4. As a 7th grade student, do you think you can change this discrepancy? If yes, in what ways?

Students then answered reflection questions asking about their perceptions of social justice and mathematics (Appendix A).

1. Write down things or ideas that you learned while you were working with the income information.

2. What understanding or awareness did you gain about income levels and possible causes in U.S. households when your teacher had you discuss issues

related to income levels? Can you explain why your thinking might have changed or stayed the same?

3. What did you hear from your classmates that surprised you or made you think about your own understanding of inequality? Were there statements that made you angry? Please explain your answers to these questions.

4. Do you think it is important for our society to work on the problem of income inequity? Why or why not? What do you think you could do in the future to solve problems of income inequity? Please explain your answer.

5. How much do you like mathematics? Please indicate a number of degrees ranging from 1 to 10. Ten means you like mathematics very much. Could you explain why you like mathematics that much?

6. What did you think of mathematics when you interpreted the data in the tables and figures? Did you learn something new about our society? Was mathematics more interesting than before? Did you feel the same before and after? Were you bored? Could you explain why you responded in that way?

Data Collection

Four periods of lessons in the last week of October 2009 were implemented for this dissertation inquiry. All the lesson plans developed were needed for instruction with the approval of the cooperating teacher. All lessons fit into the existing unit of the mathematics curriculum. Three major types of oppression--sexism, racism, and classism-- were described in the lesson plans using government demographic information. Lesson

plans were composed of two parts: Mathematics problems and discussion questions.

Students solved problems using their mathematical knowledge and then were asked to

answer in-depth discussion questions. These questions in the lesson plans helped me

investigate students' perceptions of social justice. In the pilot study conducted in 2008, I

found students felt more comfortable in open discussion with their teacher than with me;

therefore, the teacher provided instructions to the students. Also, individual interviews

were conducted with a selected number of students to investigate students' deeper

understanding of social justice.

Participants

This study took place with students in an established junior high school level

classroom. The socio-economic status and ethnic diversity of the class in which this study

took place was primarily middle to upper classes and ten percent non-white. The student

population was fit for the criteria of privileged groups presented by Goodman (2001) as

presented in Table 2-1. The number of participants from the two 7th grade classes totaled

38.

Data Sources

Creswell (1998) and Yin (2008) recommend the data collection of a case study

needs to include multiple types of information such as observations, interviews,

documents, and physical artifacts. On the other hand, Merriam (1998) introduced three

data sources of interviewing, observing, and analyzing documents as usual types of data

collection in a case study. Throughout this study, the data of observations, students' reflective papers, interviews, my reflective journal, and video/audiotapes were used.

First, observations of the lessons and discussions were utilized. Observations provided me with information about participants (Glesne, 2006). Observational notes were kept. To help make the students familiar with my presence, I attended classes from the beginning of the fall academic semester 2009 to the end of the final class for this research. The reason why I wanted to attend classes where social justice mathematics lessons were not implemented was also to help me feel like I was part of the class. One of the findings from the pilot study is that students did not feel fully comfortable sharing their ideas when I was present. I often noticed students glance at me during discussion before they talked about their ideas. During the time of the pilot study, I only attended classes a few times to collect data. I assumed students were curious about me and hesitant to contribute to the discussion in front of a stranger, so I spent more time in the classroom prior to collecting data.

Second, in order to get each student's input, students wrote a 1-2 page reflection paper that depicted their views. Some students actively participated in the discussions during lessons, but the others did not. Because of the reflective writing, I was able to listen to all of the students' voices.

Third, I categorized students' responses based on similarities, then purposefully selected two or three students from each category to interview students whose responses demonstrated more thoughtful feedback. The interviews helped clarify any remaining questions I had regarding the reflection papers (Glesne, 2006). In addition, I developed a

basic interview protocol and tailored each interview to individual students based on personal notes taken during observations and their reflective papers. A specific interview protocol for each student guided me to investigate each student's own perception of social justice and at the same time, to figure out how students reflected on issues of social justice as a group. All the interviewees agreed to allow me to audiotape the whole process according to IRB protocol.

On the semi-structured format, interviews were conducted with one student at a time. I gave prior notice to the interviewees approximately three days before the actual interview was conducted. An open area next to their classroom was used for the interview. Students had minimal transition time between classes, so I interviewed each student during his/her lunch time. In order to save time and make a comfortable atmosphere for the interviewee, the student was allowed to have food while answering questions.

Fourth, I maintained a reflective journal. This journal included field notes to provide additional information which I could utilize in the data analysis (Glesne, 2006). Field notes were also kept in the research process to reflect upon the procedures because it was almost impossible to go back to the situation to understand deeper what was occurring (Miles & Huberman, 1994).

Fifth, I requested that the cooperating teacher and students (with parental permission) allow me to videotape or audiotape them during the process of data collection. The video and audio segments supplemented the other sources, such as my observation notes were compared with the video and audio segments and data from

interviews were checked against recorded segments (Fraenkel & Wallen, 2006). Prior to this research, the University Institutional Review Board approval was granted.

Data Analysis

Analyzing qualitative data needs not only the processes of understanding, interpretation, and theorization, but also the activities of living, playing, and building with it (Glesne, 2006). As a qualitative researcher, it was important for me to make sense of the data. I reviewed my video and audio tapes multiple times to look and listen for social justice-related responses and their perceptions of mathematics. I used my observation notes where I had recorded students' visible reactions and verbal responses to the lessons. My field notes also served as a place to quickly summarize the students' responses to the discussion questions. The interviews were most helpful because they confirmed their written responses. This process overall helped me get a sense of how to conduct and analyze the data.

Schwandt (2001) also explains the process of data analysis involves "sorting, organizing, and reducing the data to something manageable and then exploring ways to reassemble the data to interpret them" (p. 7). Given the recommendation for sorting data, The data was reduced and organized by setting up a few categories of answers by their similarities. The categories were different for each discussion question. For example, there were four categories when analyzing students' responses to the question regarding their possible feelings of a person from affluent economic status discovering a friend to come from the poverty level. In this case, the categories were: Possible feelings on future

relationship, possible feelings of sympathy, possible feelings of their friends' lives, and possible feelings of their friends' efforts to move out of poverty. Using the categories for data analysis helped me understand students' thoughts much better. The category for each discussion question is specifically shown in Chapter Four. This method of data analysis was applied to all of the discussion questions.

Interpretation of Data

Qualitative researchers clarify, explicate or explain meanings from results throughout the process of data interpretation (Schwandt, 2001). Based on results of this study, the middle school students' understanding of social justice and experiences with social justice lessons as noted in Chapter Five were interpreted. I also interpreted the middle school students' ideas of possible actions to take toward social change in the same chapters.

Trustworthiness

According to Glesne (2006), results and conclusions from data analysis should be trustworthy and useful. This helps audiences believe that they need to pay attention to the findings (Lincoln & Guba, 1985). Using the concepts of credibility and transferability, I explain why this study is trustworthy.

Credibility

       Creswell (1998) shows eight procedures for a qualitative researcher to build credibility: Prolonged engagement and persistent observation, triangulation, peer review and debriefing, negative case analysis, clarification of researcher bias, member checking, rich and thick description, and external audit. In this study, prolonged engagement, triangulation, peer review, and member checking were used.

       Prolonged Engagement

       Lincoln and Guba (1985) describe prolonged engagement as a critical process to secure credibility. Sufficient time was spent with the research participants, so that a rapport was built with them. Prior to the social justice lessons being delivered, I participated in classes that were unrelated in subject matter to the dissertation research. This helped students feel comfortable to share their ideas in the research process, even while I stayed in the classroom during the time of data collection.

       Triangulation

       To achieve a high degree of internal validity, three methods of data collection were used for the purpose of triangulation with the student data: Reflective writing, classroom discussion, and interviews. Triangulation is fundamental in qualitative research (Glesne, 2006). If a finding in one data source was not supported by the other sources, it was not considered as a finding of this study (Glesne, 2006).

Peer Review

The data were interpreted in collaboration with a non-traditional undeclared undergraduate student and an education doctoral student. I collaborated with the undergraduate student during the transcribing process, data analysis, and interpretation. In addition, a doctoral student who took qualitative research method courses and conducted research projects using qualitative methods reviewed my analysis and interpretations of the data. Interpretations of the results were always read by two reviewers. No results in the findings were reported if the two reviewers and I did not agree. For example, two student responses to the statements from Seider's (2009a) research were interpreted by me as positive and the reviewers both disagreed. When I interpreted their results, I considered two different responses so I sided with the reviewers in the analysis. The process of using peer reviews helped me make reasonable conclusions (Glesne, 2006).

Member Checking

Lincoln and Guba (1985) introduce the member checking process as the most critical one to build credibility. During interviews, students' responses from discussions and their reflective papers were clarified. The cooperating teacher also had discussions with me during the research period regarding students' attitude and their comments from lessons.

<u>Transferability</u>

The usual term of external validity can be a good alternative to explain the definition of transferability (Lincoln & Guba, 1985). This refers to the extent which findings in this study could be applied to other research with different contexts or subjects. However, it seemed that results drawn from a qualitative research stay away from transferability because it investigated unique complex issues. I believe that people who are interested in this study will be able to decide whether the findings of this research were generalizable into studies in similar contexts. I tried to provide related facts to the study in order to help readers decide for themselves about transferability.

Protection of Human Participants

Since this study used human participants, the dissertation research was approved by the University Institutional Review Board and followed its guidelines. The cooperating teacher, students, and their parents were given the information to help understand details of this study and their consent for participation was attained. I also explained that any students in the study could decide not to participate at any point in the study. If students chose not to participate, alternative mathematics lessons were provided by the teacher and taught by two paraprofessional teachers.

In addition, as a part of protecting the rights of participants, I protected their privacy throughout the study (Glesne, 2006). Artifacts and audio/video tapes were always kept in a secure place. Only my committee chair and I have access to them.

Conclusion

To find answers to my dissertation inquiry, I used a qualitative case study. Five data sources including observations, students' reflective papers, interviews, my reflective journal, and audio/video tapes were used to investigate projected students' perceptions of social justice. I attempted to build reasonable and objective conclusions through interpreting data trustworthily (Merriam, 1998).

CHAPTER FOUR: FINDINGS

Overview

In this chapter, findings from my three research questions are presented. Results from classroom discussion, students' reflective writing, and interviews were mainly used as data sources for this study. My observational notes, reflective journal, and video/audiotapes supplemented the three data sources.

My findings were organized under three main topics of social justice: Class, gender and ethnicity. Under each topic, the results from the three main data sources are shown in accordance with two research questions: Students' perceptions of social justice and possible actions to take. The students' final reflections on social justice lessons and the subject of mathematics are then presented.

When interpreting results in this section, it is important to remember that the number of cited answers does not include each individual response from every student who actually shared their ideas. Results from 38 students' reflective writing and 10 interviewees were used. The number of participants in classroom discussions was different because only a small portion of students were voluntarily participating in discussion. I present responses that were similar and reflective of the typical students' answers.

Class

Students' specific understanding of issues in relation to Class were investigated. The results showed students from this privileged class middle school were aware of income levels across different people. They also noticed the limited change of income among the lower class. Feelings about trends in the data were shared as well as underlying issues about their findings. Finally, possible actions to take for changing income discrepancy were discussed.

Students' Perceptions of Social Justice

To answer this research question, three sub-questions were created: Thoughts about the data, feelings about their findings from the data, and reasons and underlying issues for their findings from the data. The process of using three sub-questions helped me to organize results clearly and explore students' perceptions of social justice better. The findings were presented according to the three data sources under each sub-question.

Thoughts About the Data

While there was not a specific question asking students' thoughts about the data in their reflective writing, results from classroom discussion and interviews showed that privileged middle school students saw different trends associated with various income levels. Specifically, they were curious why there was a minimal income change in the lowest 10th percentile over time while the income of people in the highest 95th percentile steadily increased.

Classroom Discussion

When scrutinizing the income data at the beginning, students associated different income levels with different jobs as stated:

> There are different sorts of jobs. Like, a doctor would be the yellow (highest) line and a janitor would be the red (lowest) line.

However, the teacher explained that data was not associated with specific jobs. She then asked students what they noticed about the trends. Students noticed different income trends according to various income levels. Specifically, they paid attention to the minimal income change in the lowest 10th percentile and the growth rate in the highest level over the time period. Students said:

> Each of the lines goes up into the next section of the graph except for the bottom two lines.

> The 95th percentile seems to go up and down but mostly up and the 10th percentile seem to mostly stay flat.

> People who are rich are making more money.

The results showed it was evident to students that people in higher income levels make more and more money and people under the 10th percentile earn almost the same over the same time period in the data.

Interview

The similar comments were also found from interviews to the question in regards to what students noticed. All interviewees mentioned the tendency for income change over the years looked different according to income levels.

> I recognize that the 10th percentile is not really ever going to rise. It is going to stay there forever.
>
> 10th percentile along with the 20th percentile has stayed basically the same. Even up to the 50th percentile the change has been minimal.
>
> I learned that different people earn different incomes and that the lower income of the different groups doesn't increase much over time. And the 95th percentile keeps increasing and increasing. But if you are in the lower percentiles then you are almost stuck with that forever.

Results showed all interviewees indicated people's income in the lowest 10th percentile

was minimally changed. At the same time, the continuous increase over the time period

in the highest 95th percentile was also mentioned.

Students' Feelings about Their Findings from the Data

Although there was no question asking students' feelings about their findings

from the data in students' reflective writing, it was possible for me to infer from

classroom discussion and interviews that most students considered different income

trends with various income levels abnormal. They also showed attitudes of empathy to

people in a lower income level, however, one student during classroom discussion

indicated minimal income change in the lowest 10th percentile was their own

responsibilities because, "they could do much better if they work hard."

Classroom Discussion

Reflecting on the data, a student shared feelings of being sad regarding the

income difference and minimal income change in the lowest 10th percentile.

> I kind of feel bad for people. I worry about people close to bankruptcy and are about to lose their houses. And it is kind of sad to see that the rich people are getting more and more and the poorer people are staying the same and that's not really helping.

However, another student started to debate the issue on the data with a different idea and thought that the reason for the little change is caused by people's own faults.

> Um, I don't consider it sad. I kind of consider it choice. Because when you think about it when you go to a homeless shelter, a lot of them are mentally ill. So they can't get higher and also a lot of them have been in the Army so they have an injury or something like that. So it is kind of like choice too, because if they wanted to work hard, they could do better than that.

This response was significant when exploring students' ideas on class, because the result possibly indicated that little change of earnings of people in lower income classes was the people's own responsibilities.

Students' Reflective Writing

First, students were asked what questions a family in the lowest quintile might have about a family in the highest quintile. The assumptive curiosities varied from types of jobs and reasons for rich people's success to their knowledge whether they understood how people's life in poverty looked. The list of students' answers on the question was created in Table 4-1. Some students put down more than one answer, and six students did not answer the question.

Table 4-1.

List of Assumptive Questions to Rich People

Questions about Their Success (27 respondents)
What kind of job do you have?
How long do you work?
When did you start getting such a big income?
How long ago did you get your job? Since right now there is such a bad economy.
How did you succeed?
What do you invest in?
How many years of education did you have to have to get your success?
Questions about Their Past (2 respondents)
How where you are raised? In a high end family or impoverished?
Questions about Their Feeling Towards Being Affluent (6 respondents)
What is it like to have a better home and better everything?
Do you enjoy being in this percentile?
Do you feel in power?
What do you spend it on?
Is it lonely out there?
Questions about Their Perspectives to Other People's (3 respondents)
Do you think it is fair that you get more money even though some people work so hard and still workers in an office get paid more than a garden man?
Why are the rich getting richer when we're still in poverty?
Can you give me some money?

The second question asked about rich peoples' feelings toward their friends in the lowest quintile. This question was developed to investigate students' thoughts on the possible feelings of a person from affluent economic status towards the discovery of a friend's poverty. Thus their answers are purely conjecture.

The majority of students answered that the relationship depended on the fact of whether they were truly good friends. Students usually responded by adding that they would help their poor friends if they were rich, even though some rich people have been

known to terminate friendships with people when they discovered their friends were poor. The list of answers is presented in Table 4-2. Some students put down more than one answer, and eight students did not answer the question.

Table 4-2.

List of Feelings about a Friend in the Lowest Quintile

Possible Feelings on Future Relationship (16 respondents)
They might not care, it also depends on if they're a good friend or not.
They will judge them by, like you're poor. There would be stereotypes.
Disclude them if they are not a good friend.
If it was me I wouldn't judge them as a worse person.
Possible Feelings of Sympathy (10 respondents)
I would probably feel sort of guilty that I have a better income.
If they are extremely rich they may feel embarrassed about being seen with a lower class.
They might feel sympathetic towards them because of their income.
If they were really good friends they may give them some money.
Possible Feelings on Their Friends' Lives (3 respondents)
The lower person doesn't have as many opportunities.
They won't be going on many of the trips to restaurants.
Possible Feelings on Their Friends' Efforts (4 respondents)
What mistake did they make?
Why aren't they in a higher quintile?

The last question was asking about CEO bonuses. I discovered that most students did not understand the question about CEO bonuses. The question was focused and developed to find students' perceptions on bonuses released by the government. However, students answered how they considered the amount of bonuses that CEOs received. Only one student understood the question.

> I think it was really wrong of the company because what about the other workers, and aren't they supposed to take advantage of the government generosity? Only if they deserve it and it is money that the company has not borrowed, CEOs should get bonus.

Even though this question was not presented as a finding in this study, the reason for

developing it will be discussed in the next chapter.

Interview

Students were asked to answer how they felt about people in low income levels

with minimal change. Typical answers from all interviewees indicated the data did not

look fair and understandable to them.

> People in lower classes may not have as much education, but they have similar character content. So I don't see why they are paid less money for a long time.

> I think it is ok to have some rich people, but the poorer people should not be so poor.

While conducting interviews, I sometimes saw a few students enthusiastically express

their feelings of being upset about the data (Reflective journal, November 10, 2009).

Specifically, one student made an example to compare the degree of labor.

> I don't think it is fair that some people work very little answering phones and get paid double what someone working very hard in a field would get.

It was interesting to compare people working in different areas. I would like to consider

this idea an attempt to put more value and respect to labor workers rather than measuring

importance of the two jobs by physical hardness only.

Reasons and Underlying Issues for Their Findings from the Data

The results showed that about 50 percent of the students indicated educational attainment and different jobs as reasons for various income levels. Students also mentioned possible underlying causes such as unequal opportunities toward getting an education, hiring bias, discrimination, and family's SES level.

Classroom Discussion

To understand students' ideas on this sub-question, the teacher asked students, "What did some of you put down for what some of the reasons for the income levels are?" (Audio transcript, October 26, 2009). Five students made connections between different income levels with types of jobs and educational attainment.

> Some people have better paying jobs than others. So if you get into a higher paying job you are going to have a higher income.

> Some people were able to get a higher education to get them a better paying job.

In addition, external factors such as wealth by inheritance and the family's higher SES level were also mentioned as reasons for the different income.

> Being rich can be passed down from generation to generation. If your father owns a really nice wealthy business and you are bound to get it when you are of age.

> Class. Some people could have more money and better education if they started their life in higher class.

In summary, participants' comments during class discussion showed various factors were influenced different income levels. Some reasons were already pre-determined and affecting people's lives, while a few students indicated different jobs and educational attainment.

Students' Reflective Writing

In regards to the question about reasons for different income levels, most students pointed out different jobs as a primary reason toward different incomes. Twenty six students mentioned facts related to the job.

> Some people have more important jobs, CEO, President, etc., should make more money than the janitor.

> Maybe if you have a harder job you get a higher income.

The second frequent answer was education, with five students mentioning it. Seven students did not either answer the question or respond to it.

Interview

Students were asked what would be a reason for different incomes and its various trend in income changes over the years. The results showed that five students indicated education as a primary factor regarding reasons.

> It is reasonable to get paid more because you worked hard to get a better education. So a person with a master's degree can make more than a person with just a high school diploma.

> Some people have better or worse jobs. Different jobs require different degrees. If you bail out of high school or college then you won't be able to get a job as a doctor or lawyer which pay better. You will only be able to get jobs in the food industry.

> You get better jobs because, for example, a person who wants to be a doctor can't just go be a doctor right after 9th grade. You have to get years of schooling and experience. I think if you go through college, you are going to have a high paying job, because you took your time to become an expert at whatever subject you chose. You get paid well because you really worked hard for it.

Two students also mentioned education, but they discussed underlying issues about having unequal opportunities for getting education.

> I don't know when it began, but I think that some people were raised with the thought that they can only do so good. Because of this, they don't set goals and are of the mindset that no matter what happens they have no control over their lives. Maybe they just think that what happens happens, and I can never do anything to get better. And then they send that on to the next generation, then the next generation, and then the next generation, and so on.

> I totally believe that people who don't have the encouragement that they need or the money that they need to get an education should be helped.

In addition to education, a student mentioned hiring bias could influence low incomes.

> Because of what we have been learning in the school, hiring bias could play a role. For example, Hitler didn't want Jews in Germany. I assume that there is a case of CEOs discriminating against certain races.

Two students pointed out discrimination could be a potential reason for the low income.

> Definitely discrimination has been an issue. Race discrimination has been going on for centuries. It does not show anything about race or gender. You can make an inference from the 10th and 20th percentile.

> When I was looking at the statistics of people in the lowest percentiles, I was wondering if these people were being cheated out because of their race or gender.

> After listening to students' responses regarding cause for different incomes, I

specifically referred to minimal income with almost no change and asked interviewees to respond to two statements quoted from research about raising consciousness on poverty (Seider, 2009a). The two statements are as follows.

1. Some people say that the primary cause of poverty is people not doing enough to help themselves out of poverty.

2. Some people say that poor people are poor because they do not have the proper motivation or interest in working hard.

Four interviewees agreed that poverty is a personal problem that people have to get over.

It is a personal problem. I think it will be better if we look at this more in that instead of having the 95th percentile over the next couple years go up, maybe it should stay the same and 10th and 20th should go more up.

I kinda agree with that completely. I think 100%. I think that people didn't get to the 95th percentile by going through school and not really caring about it.

I understand that there are some instances where you can't go to school because of money or something but oftentimes if you do well in high school you can get scholarships. In the end it is all about effort and how hard you try.

I think it does mostly depend on your motivation. Just as an example, there are homeless people that can probably dig themselves out but sometimes they are so used to it that they kind of think that there is no way. So motivation is important. You need to think you can do it.

However, four other students disagreed with the statements.

I strongly disagree because I look around and many places you come across people are poor and are disabled and were in the military. I have to admit there are some people who are just lazy and that is their own problem to solve. I feel some of them can't get a job because they are discriminated against for being poor.

I don't know if it is an issue about no motivation. I don't know if they get the right chances to get any work. I don't entirely agree with this.

I disagree, because some people don't have the option. Some people are mentally sick. Some can't get the money cause they can't work. Or some aren't being hired because of their race. I think a lot of people are biased (prejudiced) towards other races.

I know a ton of people who are motivated to work and get a good job, but don't get the opportunity and yet there is still those 35% who don't want to try as hard. So for the most part, I disagree with these statements.

Presenting the reasons of agreement and disagreement, the other two students explained their positions to the statements.

I think that this statement is true in about 35% of the cases. These are people who don't want to work or think that they can get the money in a different, easier way or don't want to help themselves. The other 65% are people who were let go or

who had to take care of a family matter before they could get an education. I see these as people in a situation that is not entirely their fault.

I agree with the statement about 40%, but the other 60% I think it is hereditary. I worked at the Boise Rescue Mission before and I noticed that many of them simply made bad choices like drinking too much. I think about 40% or 50% of the population fall into this statement. Many of these simply chose to pursue something other than a high paying career because the parents themselves may have been having problems, probably from childhoods. Parents with drug and alcohol problems tend to pass them on to their children.

Although these two answers indicated both agreement and disagreement, I considered the ones disagreeing to Seider's statements. This was the reason two students discussed the disagreement side with supportive examples and more rates.

Using students' responses above, it is evident they tend to extrapolate on the data beyond what the data shows. For example, some students mentioned special situations such as discrimination and hiring bias as possible causes to minimal income with almost no change over the long period.

Actions to Take

Students did not discuss this question due to the limited amount of time, so the results for this question were from their reflective writing and interview. While a large portion of students said they had no idea or could not do anything as middle school students, several mentioned possible actions to take. The most frequent responses included raising awareness through various methods such as writing letters to different people and using public signs. Protesting was also mentioned. In addition, students talked about volunteer work and in the future helping people in the low income class when they would be in positions with more power.

Students' Reflective Writing

Students were asked what types of actions they wanted to take if they thought they could do something to change the situation in the United States. Twenty-eight students answered either they had no idea what to do or they felt they could not do anything because no one would listen to 7th grade students. The other students shared various actions they could take to change the problems. The answers are listed under a few categories in Table 4-3.

Table 4-3.

List of Actions to Bring about Change

Actions (5 respondents)
I think I or any 7th grader could change this, we could write letters to the company taking part in this or even protest.
I could somehow contact the president or representatives, and tell them about this.
I think I can make change and I would stand up for rights.
You could write an anonymous letter (if the government knew that it was a seventh grader they wouldn't listen) stating your position on the issue.
Actions with Others (2 respondents)
I think we could if you had enough people and signed petitions.
I could get involved in discussions when my family talks about it and get help.
Actions in the Future (3 respondents)
Because a lot of people wouldn't have time to listen to a 7th grader, I will do actions later.
As I get older I could work on that, but for now I have no voice, or not much to the government.

<u>Interview</u>

Students were asked what types of actions they wanted to take if they believed

there were invisible problems in income distribution. Two interviewees told me that they

had no idea what they could do.

> I don't know what I can do as a 7th grader to change things, because if I write a
> letter to somebody, they are going to look at it and see that it is from a 7th grader
> and ignore it. Because they think that I don't know anything at this age.

Two other students said they could do something, but they were not sure whether their

actions would be listened to.

> I could protest but that is all I can do. I can't vote. I am not old enough to be taken
> seriously.

The other four students shared possible actions including using signs and protesting.

> We can use signs that have facts on them like something that has to do with the
> information from the graphs. So when people drive by, they start to think about it.

> We can protest against the government. Well, I would not want to protest against
> poor people.

In addition, two students expressed volunteer work and helping people in the future.

> I could just volunteer giving lunch or help get the word out. As a 7th grader,
> volunteering is probably the only way. We can do coat drives.

> I want to do well in school, so that maybe I can get a good job in the future. Then
> someday I can go back and help some other people by telling them and explaining
> why you need a good education.

> When students answered they would like to take actions to help people with lower

incomes, I asked why they wanted to do so even though they had no relationship with

them and could enjoy their lives without considering the people. It was interesting that no

students said they would not need to help people in the low income class. First, six

students explained they felt good by using their personal experiences.

> Whenever I see some poor person or homeless person on the street, I feel really bad, because I have life so good. I have many nice things that that person doesn't have. So if I can do anything to make that person's life better, it makes me feel good. I helped at a home for teenage mothers a few times. I also helped out at community service projects in our school.

> I have compassion for them and want to help them out of the goodness of my heart. My parents do donations. I want to follow my parents' example to help them.

Additionally, three students hoped to make society better through their participation.

> Well you kind of make society better. It will be better for America to not have so many very poor people.

> I heard about a man in Boise who gave a ton of money to the Boise Rescue Mission. That improved a lot of homeless people's lives. I think his example may have motivated others to help as well. All people can give motivation to others. I can also do it.

A student also mentioned a reason, but it was a different type of answer that helping poor

people can result in bringing about a good return to society.

> Because lower class people can really help out our economy. Like buying houses. Everybody is important to the country in some way.

The student was trying to say that if the richer people invested in the poorer population,

they would have more money to spend on products that would boost the economy.

Conclusion

Regarding issues related to Class, students' perceptions of social justice and their

ideas of possible actions to take were investigated. The results showed students noticed

various income trends between different income levels. They thought the data did not

look normal, and a majority of them were empathetic specifically to people in lower income classes. Possible actions to take for making changes were also discussed. Students discussed various methods such as raising awareness, protesting, and taking actions when they become adults.

Gender

This section investigated privileged middle school students' specific understanding of issues related to Gender and Income. For this topic, only male students' responses were considered as findings because this research focused on privileged students' perceptions of social justice. As Goodman's (2001) states, females do not belong to a privileged group when discussing gender.

Before discussing income data related to gender, students were first provided with data showing the relationship between educational attainment and income. Then, students viewed two additional data sets which presented facts about different incomes according to gender and I shared their reactions. Finally, their possible actions to take and the reasons why they would do so were presented by me.

The results from 23 male students' reflective writing and interviews with ten students. The number of participants in classroom discussions varied because students were voluntarily participating.

Students' Perceptions of Social Justice

Three sub-questions including thoughts about the data, feelings about their findings from the data, as well as reasons and underlying issues for their findings were used to effectively answer the research question on perceptions of social justice. The findings were organized according to the main three data sources under each sub-question.

Educational Attainment and Income

The results regarding student thoughts about educational attainment and income were only from student's reflective writing. The discussion on this topic did not take place due to the limited amount of class time. During the interview process, any specific questions related to this issue were not asked either.

Ninety-five percent of the students agreed that it was reasonable for people with higher educational attainment to make more income than people with lower educational attainment with a few additional reasons noted, such as their time and effort, hard work and tuition spent.

While the majority of students supported higher income for people with more education, a student expressed concern that some people do not get equal educational opportunities. Another student talked about society's lack of value for people who have not been formally educated in this manner:

> But that doesn't mean the less educated should be forgotten. They can bring lots to their company, it depends on what and how they do their job that should determine the income.

As to the second question asking students' plan of how high a degree they wished to attain, only one student did not give a certain plan. While 3% of students answered at least high school diploma, 95% respondents planned to get a higher degree than a bachelor's. In addition, 82% of the total students wanted to get at least a master's degree. However, only 16% of the students answered that the income table showing the data with income and educational attainment influenced their plans for future education, and these statistics guided me to conclude that students in the project school had a high level of self-esteem.

Thoughts about the Data

Students made various comparisons between incomes by gender. They noticed males have higher incomes in all levels of educational attainment. However, when students interpreted the income data by gender across states in the U.S., they did not compare the data according to gender. Instead, they made comparisons according to the states. The results for students' thoughts regarding the data were only from classroom discussion.

Classroom Discussion

Several students made comments on the data and requested additional information during the process of discussion. For example, a student raised a question concerning the number of men and women in the data which could be related to mathematical understanding.

> According to this table, it polls twice as many men though. So it is not fair to compare numbers in men and women.

This statement was critical in getting to know the student's mathematical understanding. Even though he already learned the concept of percentage prior to this research, it seemed that he did not understand what the percentage meant and why it was used to compare the data for the lesson. Using this result, I made a recommendation for future research in the next chapter.

Second, a student wanted to see if there were data available for higher degrees such as professional degrees and doctorates.

> Do females with a doctorate or professional degree make more than males with a bachelor's degree?

Additionally, another student had a different thought about work ethic.

> I wish there was another graph that goes along with this that says what the work ethic is. Does that determine anything?

It was interesting for the student to ask for additional data related to factors possibly influencing income.

Fourth, a student was curious how the income distribution according to gender and educational attainment would be in other governmental systems.

> Do you have the same charts for what the government type is? Like a communist country, China? Like how would the pay be like between men and women in other government types.

Fifth, a student used an example of his mother and was curious whether the graph was made using only full-time workers' income. He described a possible cause of lower income as a choice.

> I know my mom does this. She has a part-time job. She does not make as much as my dad. I am sure she can go into a business as a secretary and make a little bit more money, but she chooses to work not as much even though she has a degree, because my dad works full-time.

This statement might imply the stereotypes that females were usually associated with secretary jobs and that females might want to work part-time if their husbands are full-time workers.

Sixth, another student requested the most recent data on Gender and Income to see whether income discrepancy according to gender is better or worse over time.

When discussion took place about different income data by gender and educational attainment, three types of responses were made when the teacher asked what they noticed in the data.

> For both males and females, the more people go to the college, the higher salary people might have.

> Males make almost at least a fourth more than females regardless of how much education.

> High school graduate males get more than females getting an associate degree.

Even though the teacher and researcher expected students to be aware of income discrepancy between male and female, it was interesting to have a student compare data across gender. For example, the third answer above shows that females with a higher degree get less income than males with a lower degree.

Then students discussed the next data showing different income by gender and states in the U.S. At first, students shared what they noticed from the data.

> Women in the District of Columbia make more than almost all the men.

> The D.C. men make more than all the men in this table. The D.C. women also make more than all the rest.

The results showed that most students put their focus on comparison between different regions instead of comparing income based on gender in different areas. Their interest was on the Idaho (where they lived) and western states close to Idaho, so they made statements with comparisons between states close to their home and the others. They did not realize why the table was made and why I had them investigate it. In addition, the following statements gave me confidence on the finding.

> I'm not sure if this has anything to do with it but like in the old Mormon religion, the women like my mom would usually stay home, because they weren't allowed to work. There are a lot of Mormons in Utah and Idaho.

> I just noticed this when I was looking at all of them. In the last election I know D.C. and New York both voted Democratic. I'm not sure about Utah, but I'm pretty sure Idaho, Montana and Wyoming voted Republican. I don't think it has anything to do with it, I just think it was worth noticing.

It turned out that students did not focus on the fact that in all areas women working full-time get paid less than male full-time workers, but the teacher and researcher did not guide them in their discussion of the issues. This was the reason I wanted to investigate students' original thoughts. According to Brantlinger (2005), students share their feelings for the teacher's beliefs instead of discussing what they thought about the data in a social justice mathematics lesson when the teacher began with the teacher's opinion on the data. For this same reason, the cooperating teacher and I avoided leading the discussions with personal opinions concerning the data.

Students' Feelings about Their Findings from the Data

Even though male students did not share their personal feelings during the class discussions, my observation helped me infer they did not feel good about it. Students made strong statements in their reflective writing and stated income discrepancy by gender is unfair.

Classroom Discussion

The teacher did not use any specific question to ask about the students' feelings in class. However, when they talked about possible reasons, their feelings were implied. Most students used the word "unfair" when they shared reasons for what they found from the data. Some male students looked a little bit embarrassed in front of the females. In fact, I heard a couple of male students saying "sorry" to female students at the same table (Observational notes, October 27, 2009).

Students' Reflective Writing

Students were asked how the data made them feel. Twenty students did not feel good about what the data represented and its inequity for women.

I feel that our world is corrupt and horrible if we can't each be given equal opportunities.

Our generation should be working to upset the discrepancy and possible causes. It is unfair to the women.

I think that there shouldn't be this much discrepancy between men and women.

> It is unfair to the women. I want to step into a female's shoes. We could support a women's worker rights association to change the way females are hired and terminate discrimination.

Among these students, one student mentioned the low income of women with an education of less than 9th grade and was curious how they can raise their family with a low income.

In addition, one student wanted to find what the real reason for the income discrepancy was. The other two students did not answer the question. Sharing their feelings, most students also pointed out equal opportunities as a possible solution toward reasonable income data between women and men. More about the reasons and underlying issues are presented in the next part.

Reasons and Underlying Issues for Their Findings from the Data

Students mentioned various reasons for their findings in the income data during the class discussion, such as limited job opportunities, stereotypes, and sexism. In their reflective writing, 40% of the students answered stereotypes and sexism influenced different income levels by gender.

Classroom Discussion

Students shared what underlying meanings were on what they noticed from the data throughout the lessons.

> It is possible that women work for really low paying jobs or are expected to just stay at home.

Regarding this opinion, the teacher added that in the past there seemed to be limited

opportunities for women outside teaching, nursing, and other lower paying jobs. In

support of this idea, students made comments about different gender roles in society. For

example,

> Well, I used to watch Little House on the Prairie when I was 5. And it would always be the men who would be working and then the women who would be sewing and cleaning the house. And the men would come home late from work, and the women would ask the men, how was work and the women would be cleaning the house, doing laundry, and cooking. I don't know if that was just how it functioned.

> It is not fair to women to be subject to old fashioned attitudes. Women also should be encouraged to take high paying jobs.

Based on these responses, it was likely students accepted that there still existed

stereotypes about males and females in regards to the traditional role of the male of the

household having a job that actually earned money/income and the female making sure

that things at home were taken care of.

> In addition, a couple of students raised awareness on sexism in connection with

stereotypes.

> I know there are a lot of my friends who are girls that are even smarter than a lot of my guy friends. I think it is weird and almost like racism except that it has been going on forever. There is no, like, calling attention to it in the last 100 years. They're not equal.

To these responses, the teacher commented that it was interesting to recognize that people

are still working on it in order to bring along some equality. She also commented that the

students' generation has some attitude shifts that needed to be made about women if there

were stereotypes and low expectations of women.

Students' Reflective Writing

Investigating tables and figures which showed income difference according to gender, students were asked what the reason was for an income discrepancy between females and males. While six students had no idea, seven students indicated different job opportunities for women and men. Specifically, a few students mentioned it could possibly come from physical differences between men and women. In addition to physical difference, a couple of students specified that women had less income because of their positions paying them less.

I think it is because females don't get as high paying of jobs and men do.

There are better paying jobs for different genders.

Additionally, one student asserted that men were more competitive than women. Nine students were thinking stereotypes and sexism might influence different income levels according to gender. They indicated that men might be taking advantage of a stereotype and women could be the sufferers because of it.

Maybe because some people only want to hire males or females because they think that only males can do a certain job or only females can do a certain job.

For some reason, males have always had supremacy over woman. Men usually get big corporations, since people have always thought "they're more fit for the job," leaving women behind.

Managers might just think that guys accomplish more than girls.

Due to sexism and stereotypes in the workplace and hiring for many major companies.

While students were discussing stereotypes on gender, one student specifically explained how stereotypes were historically transformed into its current status.

> There is a difference because men have been given more power in history and that may have transferred into our modern day because men from history may unfairly have more power. They are tied upon with more promise than men are therefore given more opportunities to a better education and to get a better paying job. There are also significantly more male workers than females and that changes the data.

This response was impressive in that the student mentioned the process of discrimination of women with historical facts.

Interview

All interviewees were primarily confirming answers in their reflective writing. They tended to gravitate toward unequal opportunities as being the primary cause of the discrepancy in the statistical information. While three students had no idea, six students made comments related to hiring bias as a possible reason for the difference.

> Employers are obviously going to pick people with more experience and education first, but it seems that they also would prefer men over women because it is something that has gone on way back.

Another student listed a different social status of women and men listed below.

> Men have taken leadership roles while women have been mainly in support roles. It has only been in the last 60 or 70 years that women have really begun to assert themselves in more prominent roles. Even still, women tend to have less powerful positions in society. I think there are more men in high paying jobs than women. It seems that men tend to be seen as symbols of power by many people.

In addition, it was interesting that one student made a connection between him and income inequality when he talked about unequal opportunities.

> While I would enjoy the extra male earnings, it is unfair to the women.

Based on his comment, I was convinced that the student found the issue might be favorably working for him.

Actions to Take

Students shared possible actions to take. While a small portion of students had no idea what to do as 7th grade students, a multitude of possible ways to make changes such as raising awareness, collaborating with people in power, and making organizations promote women's rights were mentioned.

Students' Reflective Writing

In regards to the question, what students can do to change the discrepancy as 7th grade students, several ways were mentioned. Four students accepted their social status as middle school students with less rights and power toward political activities and thought they had no idea what to do. Five students discussed the possibility of working on problems after they were older.

> I don't have a voice in the world so I can't really change anything. When I'm getting older, I will have more of a voice and will do something.

> We can grow up and try to do something about it.

> I really don't know how I can change it unless I become in a high power.

In addition, six students wanted to collaborate with other people related to issues and people in positions who could help students' attempts at change.

> Send a letter about it to the governors' and the presidents' wives.

> I think we could join a women's worker rights association so that women can get equal jobs.

Personal attitude change was also listed as a solution by two students.

> Be open to the females that work as hard as others.

>I would not have stereotypes from history that says women are staying at home who aren't capable of doing actual jobs.

Additionally, five students wanted to raise awareness to the public, and one student discussed making organizations for promoting women's rights. Finally, one student asserted that women needed to speak up about the problem because lower income was their problem.

Interview

Students pointed out various types of actions that they considered to take in order to make income look more reasonable. One way toward a solution was sharing information with others who did not have awareness of the issues. Four students shared this idea.

>I can stand up for women's rights and spread the word. I think that simply having an awareness of the problem is the first step.

>It is important to tell everybody about this. Friends, siblings, other relatives, and anyone you come across. So you can get the word out.

>If we knew the root cause of why and how this is happening, then we would be able to spread the word and make a change. This could be done either with the government or with those who are in charge of hiring.

In addition to raising awareness, two students expressed doing this through people in positions of power change. One student especially discussed contacting women in power to have them involved in the issue.

>I think that presidents' wives like Michelle Obama and governors' wives are in a position where they can champion the rights of under-represented women.

Two students showed desire for active involvement such as making changes by setting up organizations.

> I want to create an organization like a women's worker rights association that could help balance the discrepancy between male and female incomes.

> I would like the idea of getting something for women so they can get into higher positions. I might promote a system to increase the ratio of women to men in high governmental and economic positions.

Finally, there were two students' answers that gave no ideas for actions to take.

Conclusion

Regarding issues related to Gender, students' perceptions of social justice and their ideas of possible actions to take were investigated. Students made various comparisons between different incomes by gender and found the data looked unfair. They indicated possible reasons such as unequal opportunities, stereotypes and sexism. Students also mentioned ways to make changes, such as raising awareness to the public, contacting people including women in power, and setting up organizations to promote women's rights.

Ethnicity

In this section, I investigate students' specific understanding of issues in relation to Ethnicity. After reviewing national and regional income data by ethnicity, students were asked discussion questions on what they noticed, possible causes to income discrepancies, and types of actions they might take to help balance the income discrepancy.

There were a few non-white participants in this research. According to Goodman's (2001) criteria in Table 2-1, Results from non-white students were not used since they did not belong to a privileged group.

Results from 32 white students' reflective writing and interviews with ten students were used. The number of participants in classroom discussion varied because students were voluntarily participating.

Students' Perceptions of Social Justice

Two sub-questions covering thoughts and feelings about the data as well as reasons and underlying issues for their findings from the data helped me answer the research question. My findings are presented according to three data sources under each sub-question.

Thoughts and Feelings about the Data

Students were surprised at the data showing different incomes by ethnicity. Their responses were mainly divided into two categories: Surprise at the different income by ethnicity and surprise at white's income not being the highest.

Classroom Discussion

The teacher facilitated discussion using the following question, "How many of you were surprised at this data? What surprised you in this data?" (Audio transcript, October 29, 2009). At that point, two students raised questions regarding the data itself. A

student was wondering why Native Americans were not listed in the table. Another

student asked what the population of each ethnic group was. The teacher answered the

first question stating there was not enough data to include them on the graph. She also

responded to the second question noting the question as an interesting one, but stated

students needed to remember that these numbers represented the mean; the mathematical

average of the households.

As discussion started, students' comments regarding the data were categorized

into two types: reflections on whites' income and income difference by ethnicity. First,

students were curious why whites, which is their same ethnic group, made less than

Asians.

> I was just kind of surprised because like with the female and male data I thought that the whites would make the most money. And I am still kind of questioning why/how the Asians make so much money?

> I thought that either whites would make a tiny more than Asians or Asians where they are and whites would be way up there, or really close to Asians. And I was surprised that Asians make more than us.

It was clear that students interpreted the data in accordance with their own ethnicity,

white, and that they were surprised that Asians' income at all levels in all regions was

more than whites' income. Since whites are the dominant racial group in the country,

there seems to be a stereotype or assumption that they would also make the most money.

On the other hand, some other students raised questions as to why there was income

discrepancy by ethnicity and mentioned prejudice and discrimination.

> I just think that people are still prejudiced against other races. And that's why the table is what it is. And there might be some underlying discrimination going on.

Additionally, while investigating the regional income data including the students'
own communities, they shared their findings and thoughts regarding the graph. In
response to the question on what they noticed from the graph, students made comments
including some information which was not directly related to income discrepancy by
ethnicity.

> It seems like the African Americans and Hispanic people are really close to each
> other a lot.

> Asians are always the highest.

> Asian people in Ada County make more than Asians in the rest of the U.S.

> Montana is pretty much from anywhere from $40,000 to $20,000 for all
> ethnicities.

> I was kind of surprised that Ada County had the highest median income out of all
> of them.

In addition, students were surprised at the data and curious why household income was
different by ethnicity.

> I was surprised that African Americans are where they are, because after the Civil
> Rights Movement and everything I thought people would be more open-minded. I
> wonder why, but I guess this discrepancy was caused by either prejudice or lack
> of being open-minded.

> I was kind of surprised that Hispanics make more than African Americans. From
> my experience, when Hispanics come to the United States, they are really poor.
> And I heard there are businesses that would fire young people and hire Hispanics
> who would work longer for less money.

The results from discussion showed students found income differences and were curious
of the underlying issues toward it.

Students' Reflective Writing

After interpreting data, students' feelings regarding the data were mainly one of surprise. However, there were different points for their surprise. Twelve students assumed white people's income, the same ethnicity as them and their parents, would be the highest among people in the United States. They were surprised that whites were not in the top.

> I really wonder why this is like this. I was also kind of surprised that whites do not make the most. I was really surprised on how low African Americans were on the charts and surprised how high Asians were.

> I was surprised that whites didn't receive the income like another. I don't usually see Asian people working and you always see whites.

Eighteen student responses were not limited to a comparison between whites and the others, but they were also surprised of the different income levels according to ethnicity.

> I think that this data is surprising, because I didn't think it would be Asian at the top income. Unfair because each race should have even opportunity to get a high income and in this country that isn't happening.

> I was very surprised. I think it is sort of wrong that Asians get so much more money than Hispanics. You should get paid by how hard you work.

The other two students did not write their reflections in regards to the income difference.

In addition, the students were asked their thoughts about ethnic groups that make more income and ethnic groups that make less. Their responses to the question showed that they tended to focus on ethnic groups who made less income, even though they had two options to choose when answering. Because of this, I assumed this situation implied that students, as individuals from dominant ethnic groups, felt empathetic toward the minority ethnic groups when discussing income discrepancy by ethnicity.

My parents are white. I sadly think we might get a bit of advantage from that. I don't think it is fair to get any advantages from it. Income or anything.

My parents are both white. It is sad to think that other ethnic groups make less than us. Other cultural groups don't deserve to make almost nothing in some cases.

However, only one student explained the data did not look too bad because of white's second highest status in the income data.

I think that people kind of got over discrimination by race but I guess not after seeing this data. I think it is good whites aren't on top because the other races may move out of our country.

Finally, it was interesting that no one said ethnic groups with lower income should catch up to make the data balanced.

Interview

Two different types of students' responses to the data were found; one was surprise at income discrepancy and the other was surprise at white's income not being the highest. Five interviewees mentioned surprise and unfairness in comments made about incomes listed below.

I was sad and surprised at the same time because some people are making less money than others between races. I didn't think it would be this unfair.

Among five interviewees, two of them specifically thought that it didn't look too bad because whites' income was not the highest, even though they were surprised at first.

I thought that people had mostly gotten over racial discrimination issues but the data does not seem to reflect that. I think it is good that whites are not at the top. I think it is good for our country that other ethnicities move here because it brings different perspectives of the world and makes our country stronger by our differences. But if whites are always on top of everything, then it might make people of other ethnicities think that going back to their countries of origin give

them opportunities of making more money. If white people are always number 1 or in the top 95% percentile and always making more money than everybody else, it might make an impression that there is an inequality.

I don't think this is really bad. If they had a stereotype that said that they were stupid or something, then that would be bad. I think a stereotype where Asians are favorable is a good one. As long as it is not whites, it is ok.

The other five students mentioned being surprised that Asians had higher mean income than whites.

I was surprised to see that Asians averaged more income than whites because I had history last year and learned all about slavery. So I was so used to see whites on top of everything. I think it would be interesting to see what the average income of white males is compared to Asian males as well as white females compared to Asian females.

While answering their questions, I often heard students mentioning inequality and discrimination (Reflective journal, November 19, 2009).

Reasons and Underlying Issues for Their Findings from the Data

The majority of students pointed out discrimination as an underlying issue toward income difference. Lack of education was also mentioned as a possible cause.

Students' Reflective Writing

To deeply understand students' thoughts about possible reasons for income differences, I asked what factors they thought might be the cause. While seven students chose education as a cause, eighteen students picked racial prejudice and hiring bias as reasons for different incomes. Samples of students' responses included:

Because the people hiring might think that different ethnicity groups can do better work than others.

> Due to racial segregation and hiring prejudice.

> I think they are different because some people won't let some people of a different face work in a high paying job. It's sick and wrong, it shouldn't be like that, they are humans, just like us.

While students mentioned a general perspective of prejudice, a couple of students shared what could be examples of it.

> Discrimination and racism may still prevent African Americans from getting a decent paying job. Hispanics may work hard for cheap because they think they were here to find a job. Whites make their amount of money because they get educated but not all in Americans are able to succeed.

> I think this might be because although it is illegal some jobs only hire certain ethnic groups.

Based on the examples that students provided, I was able to infer that middle school students knew prejudice existed in our society. Such prejudice might be one of the causal factors of different income levels by ethnicity. The other seven students had no idea.

Interview

Nine interviewees indicated prejudice as a possible cause and mentioned different stereotypes for different ethnic groups. Using examples of African Americans and Hispanics being undervalued and discriminated against, five of them shared their knowledge of stereotypes on these two minority ethnic groups.

> Blacks don't earn as much as whites maybe because it was only about 40 years ago that they started to have the same rights as whites. Hispanics may be earning less due to the large number of illegal and undocumented workers who are taking very low paying jobs.

> Often there is a prejudice toward African Americans. That simply has persisted over time for one reason or another. For example, when I was in Washington

D.C., there was an African American panhandler and then there was a white panhandler. Then this white woman walked by and gave a dollar to the white panhandler and walked off and did not give anything to the black panhandler. This has been going on and on for decades and even centuries.

I don't know that Asians work better than African Americans. But maybe they have different job opportunities where African Americans may get a job that requires them to work hard but not earn as much money as another person who has desk jobs.

I think that racial discrimination, especially against African Americans still exists today. My teachers have told me that in the south they still aren't as equal there as most of the rest of the country. I also think that Hispanics are given the stereotype that they are especially willing to do hard labor for less money.

In contrast to statements listed above, the other four students who mentioned stereotypes in their interview talked about positive stereotypes toward Asians regarding their high income.

I know that there is stuff that I heard about how Asians are raised in an atmosphere that stresses the importance of hard work and respect for elders. Whereas it seems that in many households in America the importance is on playing video games, watching TV, and eating junk food.

I think that the difference of incomes between the races is because of stereotypes of the different races. Some people may think that one race works harder than another or is better at one job than the other. For example, if you are Asian, then some people may think that you are super smart and so you may get a better job because of it.

One student directed his statement to an assumption that whites had more opportunities than minor ethnic groups such as African Americans and Hispanics.

I guess whites have more chances than African Americans and Hispanics. I don't believe that the idea of racial superiority will ever completely die.

In conclusion, I was able to conclude that these middle school students listed prejudice that included stereotypes both positive and negative. The types of prejudice were quite different for each ethnic group.

Actions to Take

Students mentioned possible actions to take. The results from students' reflective writing and interview showed various types of actions such as raising awareness, working with people in power, protesting, and educating parents.

Students' Reflective Writing

Even though twelve students did not believe they were able to change or bring attention to the disparity of incomes (specifically, one student wrote down that it was impossible to change peoples' views since they came naturally), the other students provided possible actions to take as middle school students. Raising awareness was the most popular way of action. Eight students discussed this.

> I can always raise awareness. And, I also can speak to different people against it if I notice it.

> I think I could raise awareness to people about this discrepancy. Tell them that there is always going to be someone with a lower income than them possibly because of ethnicity.

While three students considered protesting as a way toward change, four students were discussing getting other people, including people in power, involved to work on racial issues in the following ways:

> By emailing the black income, white income, Hispanic income, and Asian income to the White House for analysis.

> I will talk to bosses.

Two students chose to work on the issue after they became adults and were in positions to work with diverse people.

When I get older, I can make some things more equal.

I will treat people with different ethnic groups with respect at work.

In addition, a student expressed it would be important to educate adults because of their roles raising children.

It would be very simple. Sadly, a lot of discrimination comes from their parents. You have to educate the parents, then the kids.

Finally, one student wanted to help lower income families directly when and where they needed help and two students mentioned working hard to raise whites' income.

Interview

Due to the limited amount of time for interviews, interviewees only confirmed their answers in their reflective writing and, if possible, a more background information of their ideas. For this reason, they noted possible actions that were the same to those mentioned in their reflective writing.

Various types of actions were listed as possible attempts to change the different incomes by ethnicity. In summary, two interviewees asserted they would like to help people become aware of the situation. One interviewee wanted to make a higher income in the future to make whites' income increase. Two students discussed protesting. One student wanted to take actions after he became an adult. One student maintained parents should be educated. Three students had no idea, but two of them briefly mentioned collaboration.

<u>Conclusion</u>

Regarding issues of Ethnicity, students' perceptions of social justice and possible actions to take were explored. When interpreting the income data, student responses to the income data were categorized into two ideas: Income difference by ethnicity and whites' income not being highest. While education was mentioned as a possible cause, students primarily indicated discrimination as an underlying issue of income difference by ethnicity. Finally, students discussed possible actions to take such as raising awareness, protesting, and working with people in power.

Finishing Reflections

Students were asked to answer a total of eight reflection questions to wrap up the social justice lessons for this dissertation research. Students' reflective papers included responses to a survey composed of three sections: Responses to data, possible actions for change from privileged middle school students, and feedback on mathematics lessons developed specifically to teach social justice. However, the results from the questions regarding their understanding of the data, thoughts on society's role in resolving the issue of income discrepancy, and actions to take were not listed in this section since findings to similar questions were presented in earlier parts of this chapter.

<u>Reflections on Social Justice Lessons</u>

To investigate students' understanding of social justice, results from 27 students' reflective writing and ten interviewees were used. All of them were white and males. Students did not discuss the final reflection questions due to limited class time.

Results showed students remembered facts related to education, gender, and ethnicity while no one mentioned facts related to class and income, even though this was one of the three most impressive facts in the lessons for this study. In addition, all but one student reported their awareness had been increased. Students were also empathetic to the income discrepancy, but a few male students were surprised their female classmates' lack of reactions to the data.

Students' Reflective Writing

The students responded most to change of students' awareness, and thoughts of their classmates' reactions to income data were from their reflective writing.

Three Most Impressive Facts

Nine students wrote down facts concerning education, gender, and ethnicity that they were able to retrieve from the data introduced throughout the research. The other eight students also listed three facts, but they were related to only one or two topics out of the three previously mentioned. No student cited any information related to contents of Class and Income. From these results, I can surmise that the topic, Class and Income, did not draw students' attention as much as the other three.

Change of Students' Awareness

I developed a reflection question to investigate how students' thinking or awareness of income issues have changed since they started participating in mathematics lessons for social justice. All students, except one, answered that the level of their awareness had been changed, and they credited the lessons with eye-opening opportunities for unconsidered issues in the past.

My awareness of the issues has grown.

I became more aware of how bad prejudice is.

They have changed a lot. Now it is not just something that I do not recognize. It now seems that data really shows it is a problem.

Well I never had an awareness of income issues. Only time I thought about issues is how much my family makes. But now I have awareness.

The one student answered he had already been exposed to the income discrepancy data through some resources.

Thoughts to Classmates' Reactions to Data

In regards to the question asking what students heard from their classmates and whether the statements made them angry, the majority of students agreed that their classmates and themselves shared similar opinions (were empathetic) about the data. Also, of them thought the income discrepancy looked unfair. In addition, a few male students answered they were surprised at the reactions, including both males and females to the data.

Sadly some of my classmates did not take this seriously enough. This really infuriated me how some did not care about some easy, fixed, terrible things that

live and breed in our so-called "equal" society. Many of us are blind to this, but from this I see a lot more of what can be fixed.

I was really surprised that the girls weren't angrier. They didn't get angry, in my perspective, at all.

A tablemate of mine said she was really mad at the table. She was saying that as if she had no way of changing that fact. It was surprising because she had given up on changes.

Even though the data showed men's median earnings were higher than women's and the overt implications that males may have more opportunities to earn higher incomes by unconsciously taking advantage of this social phenomenon, the male students showed dissatisfaction to the data.

<u>Interview</u>

Students were asked their feelings about the data, possible actions for change, and personalized questions for some of them based on my observations during class periods.

First of all, while most student responses were almost similar to answers in their reflective writing, a couple of students made additional comments concerning their feelings about the data.

I don't want everything to be perfectly equal. It never will be. It never should be. But it would be better if it was more well-balanced than what it currently is.

I think if everyone got paid exactly equal, then that would be like communism. I don't think I would like that. However, I think this data should be reconsidered.

Students did not believe a totally equal society would be realized, but the data definitely implied some underlying issues.

The type of actions middle school students might want to take to effect change was also asked. While all students confirmed answers in their reflective writing, one student added a strong comment.

> I think I can make changes because it has been done before. During the Civil Rights Movement, there was a children's march down in Alabama. Thousands of children went down to Alabama to support the rights of African Americans. They ignored the possibility of getting hurt or even killed. When many people get together, change can be made.

Based on this comment, I was able to find out that even some middle school students considered themselves potential activists to make changes in society regardless of fear.

At that point, another question was asked on why they would like to help people in minority ethnic groups with less income even though they might not have any personal relationship with them.

> Because people who get lower incomes often don't have as big a voice and it is sad to see how they live their lives.

> Out of the goodness of my heart, I have compassion for them and want to help them.

Their answers led me to conclude that they had a sense of moral justice to consider others.

In addition, three students were selected regarding their attitudes during class periods. These interviewees showed different degrees of participation during social justice lessons compared to their attitudes in class before activities for the research began (Reflective journal, October 29, 2009). This fact influenced my decision on which students were chosen for the interview. Two students took part in regular mathematics lessons, but they did not show a strong attitude during the lessons for this study. In other

words, I noticed that during regular mathematics lessons the two students raised their hands frequently and shared their ideas of problem solving, but they did not do so in the lessons for this research. Students answered:

> I think I am probably just shy about my answers. I probably raise my hand more in math than the other subjects like English, social studies.

Their responses were similar and both said they were not brave enough to share their ideas in front of the other students. On the contrary, a student actively participated in lessons during this research. According to my observation, I noticed that there was an extremely different attitude, and the cooperating teacher agreed with me about my observation. Thus, I asked him why he had a different attitude during the social justice mathematics lessons.

> It was something new that I hadn't really done before. And I had more to say on this subject. And it wasn't as boring as regular math normally is.

The student pointed out that more chances for discussion in mathematics lessons for social justice helped him to become more interested in this type of lesson.

Finally, I asked students whether they shared facts from the data along with their feelings and thoughts about it with their parents. The result showed that six interviewees did so.

> I talked with my parents a little bit. I told them what I knew and what they thought about it. I don't remember exactly what they said, but I remember that they were shocked in the same areas that I was. It proved to me that we have the same outlook on the world.

> I talked with my parents and told them a lot of the facts. I asked them what they thought about it. They were surprised and disappointed in how the world works. They thought it might be unfair. They were surprised because they didn't think that there were still race issues going on.

Students also proved that their parents had similar feeling about the income discrepancy and possible causes for it.

Reflections on Mathematics

To investigate students' understanding of mathematics, I used results from 27 students' reflective writing and ten interviewees. Even though 38 students participated in this study, I was only able to collect final writing reflections from 27 students. Students also did not discuss the last reflection questions because of limited class time.

Students reflected on mathematics problems and learning activities in social justice lessons. A majority of students showed interest in social justice mathematics lessons and considered it more interesting than regular mathematics.

Students' Reflective Writing

Students indicated a number from 1 to 10 to show how much they like mathematics with 1 being the least and 10 the most interested. Nine students selected the highest between 9 and 10. Eight students chose between 7 and 8. Six students indicated between 5 and 6. Four students selected numbers lower than 5. The results showed that more than 60% of respondents liked mathematics.

I also asked students to share why they liked mathematics for the degree which they reported. They liked mathematics because they learned much and stated they were good at it.

I am good at it and I just enjoy doing it.

> I think math is a lot of fun and I always learn a lot.
>
> I just like to work with numbers, and graphs, and stuff like that. Also I'm good at it!
>
> I like to challenge myself.

However, students who indicated they did not like mathematics provided no specific reasons for their opinions.

In addition, students were asked to answer what they thought of mathematics when they interpreted the data in the tables and figures from real-life connections. Twenty students thought it was interesting to have mathematics lessons related to social issues.

> I am glad that this was put together by graphs and tables because of how the reader can see the staggering numbers and differences between incomes due to education, race, and gender. Many would hear those numbers and say it wouldn't matter, but when you see them you see it so much differently.
>
> I really enjoy it. I get to do something fun and learn what our world is really like or at least in America. It also educates you on what needs to be different.
>
> I thought it was really cool to think of math in "world" ways. You learn about things in the world through math.
>
> I was able to reflect on the things I learned previously. The tables were more interesting for society and not math.

One student in this study indicated mathematics was better because students can learn how to change the world. While two students felt the same about regular mathematics, one student considered it a type of analysis rather than mathematics. One student reported it was boring and two students did not answer.

Responses to the question asking if mathematics was more interesting than before, 12 students answered mathematics in this study was more interesting than regular

mathematics. While nine students felt the same before and after, four students just reported it was interesting without comparison. Two students did not answer.

Students felt the same about mathematics before and after this study because social justice related mathematics problems were still mathematics. Students who answered either mathematics is interesting or more interesting stated the following reasons:

> I think math was more interesting than before. I got to learn new things about our society. I also liked being able to learn what my classmates thought about these issues too.

> I think mathematics is more fun when you learn about society because again it is more than just numbers. It's things that can make a difference.

> It was cool to look and use math to graph some very interesting information that brings up the question, are we equal in America? We could clearly work on that.

> Math was interesting because we got to learn a lot about discrimination and the numbers on the tables were surprising.

The results showed students liked mathematics in this study due to its application to the real world.

Interview

I asked students to respond to what they thought of mathematics when they interpreted the income data in tables and figures and learned something new in our society. Nine interviewees expressed interest and excitement to social justice instructions in mathematics.

> I thought that it was very fun and interesting that you could change mathematics to be almost political.

> I thought it was good to learn about things that are going on in the world as opposed to just learning fractions. It made me feel like I was learning real life skills, not just facts.

> I think it's better to do this because you learn more than numbers, you learn about how you can change the world. This is why I think it's good to learn math in these ways.

Of particular notability was a student who talked about an interdisciplinary approach of social justice lessons which could be incorporated with topics in other subject areas.

> I liked being able to use the math and learn two things at once. I thought this type of lesson was great. It was great being able to use our skills to figure out what is happening. I like these lessons more than regular math because my best subjects are social studies and English. These lessons in math allow me to revisit things I learned in the other classes such as the Civil Rights Movement and the Holocaust, but from a different perspective. I get to use my math skills to learn about the statistics that reinforce what I learned in the other classes. And so this type of math class goes well with those. They build on each other.

Unfortunately, one interviewee answered he still did not like the lessons, just because it was mathematics.

I also investigated students' feelings about social justice lessons in mathematics compared to regular mathematics instructions. Six interviewees answered social justice mathematics lessons were more interesting than regular mathematics lessons while the other four interviewees answered the lessons were either the same or less interesting.

> I think this type of math makes it much more interesting. If you just want to learn about math, maybe the old way is better, but if you want to learn about the world and how to apply math, then this way is much better.

A few of them eagerly showed interest toward having social justice lessons with other topics.

In addition, students were asked to compare the complexity of mathematical problems between social justice lessons in mathematics and regular mathematics classes.

All interviewees but one responded that social justice-oriented mathematical problems were not as difficult as regular mathematics problems.

> It was kind of easy to find the percentage because you take even big numbers and rounded it and made it simple. But if we had to use the exact numbers, I would not be able to solve that.

> The math problems are not that difficult. It just took a little more effort to process the numbers.

> The numbers were harder, but I was able to factor them down, so that I could work with them.

> I do alright as long as I have a calculator.

These answers were unexpected because my observations of students during the research class periods looked like most of them had a hard time solving mathematical problems involving large numbers. Thus, both the cooperating teacher and I agreed that because it was likely that students would have a difficult time doing mathematics with numbers bigger than 1,000, we decided not to focus on students' mathematical abilities during the research.

Conclusion

I investigated students' perceptions of social justice lessons and mathematics. The results showed students had increased awareness on social issues. They thought the income discrepancy looked unfair. In addition, a few male students were curious as to why their classmates, including female students, did not take the issues seriously and become angrier at the data. I also found students wanted to help people with lower

incomes through a sense of morality. Finally, a majority of students considered social justice-oriented mathematics lessons more interesting than regular mathematics.

Conclusion

In this chapter, findings were presented for the research questions by investigating various data sources such as classroom discussions, students' reflective writing, and interviews. Using income data related to class, gender, and ethnicity and working with numbers helped students to better understand the data. Students were able to discuss their findings and feelings toward different tables and figures showing income discrepancy in the United States. As a result, it was discovered that students connected income discrepancy with possible underlying issues such as discrimination, hiring bias, and unequal opportunities. In addition, students believed they would take actions in pursuit of changes and social justice, even though issues with underlying problems were not directly related to them. Finally, students found mathematics as an interesting subject when learning about real world situations. Many expressed an interest for more real world topics in the future.

CHAPTER FIVE: DISCUSSION

Introduction

This chapter begins with my personal views on how I became interested in the topic for my dissertation research. It is followed by a brief introduction of this study, discussion of the findings, limitations addressed, and list of recommendations for the future research in teaching for social justice.

Personal Views that Influenced My Research

Even though the proposal for this study was established based on theoretical background and prior research, my personal views are shared and why I chose the topic of teaching social justice with students from privileged groups. In brief, I wanted to provide learning opportunities with privileged students to see inequality in the real world and critically think about what fundamentally might cause inequality. Through this process of social justice education, I wanted to investigate my belief of the possibility that privileged students could learn about social justice issues that may prevent them from becoming inconsiderate adults, oppressors exploiting the weak, and/or making policies favorable only to them.

When narrowing down research interest for my dissertation, my accumulated experiences from personal life as well as personal reflections on what I have read gave me an opportunity to find the basis for this study. From the initial step of my doctoral study, I was mostly interested in multicultural education because my native country,

Korea, has a growing population of diversity. I wanted to contribute to transforming

Korea into a society of harmonious coexistence with what I learned from my study. My

research interest made me pay more attention to past and current social issues including

conflicts among different ethnic and social groups. This study also led me to an interest in

teaching for social justice because I thought achieving social justice would have similar

educational goals with multicultural education such as equal educational opportunities for

students from diverse ethnic and social class groups. At some point, I imagined teaching

social justice could do even more than multicultural education because social justice

education encourages students to find fundamental causes of problems and to take action

toward change.

During this process, I also realized that it would be easier and faster for the

oppressed to work toward finding their rights instead of expecting to change personal

attitudes of all people in power and then collaborate with both classes for social justice.

This does not mean that individuals cannot pursue a society of harmonious coexistence

nor that I give up on working toward an ideal society. I believe it would be much easier

for the oppressed to achieve what they want through their own efforts. That is why it

seemed to me that stubborn attitudes of some people in privileged status are not easily

changed and their attempts to make their own utopia will persist.

Here, I would like to elaborate on my thoughts regarding two characteristics of

some privileged adults mentioned above: stubbornness and making their own utopia. First,

I think it is difficult to change attitudes of people in power, particularly people with

higher educational attainment and people who are in a privileged status. Even changing

mind sets of regular adults can be difficult. For example, in academic areas where people are considered being more acceptable to ideas and opinions from the opposite side, I have seen many conflicts between scholars. They avoid seeing and talking to others who have different viewpoints instead of pursuing common ground through dialogue. While people in academia, usually known for pursuing truth and justice, often do not coexist well, I doubt that people in society generally seeking wealth and prosperity could work together for social justice by giving up their goals related to money. My second thought is that some privileged people attempt to make a society for their benefit. I think it is natural for a group of people who have the same goals to work hard toward achieving them, however, privileged people achieving their own objects usually hurts people in underrepresented groups. Decisions of privileged people in political, economic and social power often negatively influence the lives of people in lower classes. On the contrary, I have not seen many cases in which privileged people are marginalized and hurt by decisions and actions of the minority. When resources are limited, often the distribution of goods is not equitable in society; a small group of people ends up getting more. The problem in this situation is that privileged people are always the ones who get more and the minority has less access to resources.

Even though some people from privileged groups can be sympathetic to the oppressed and are willing to help them, I believe privileged people in general should know what might cause social problems. Showing interest in the oppressed and giving help itself should be admired and praised very much, but it is also important for privileged people to think about primary causes of social justice issues. I believe there are

ways to fix problems in society even though social issues seem to be complex and often intertwined with many causal factors.

At this point, I began thinking that social justice education for young adolescents could play an important role toward change if educators implement it to help students keep their sense of morality and fairness as they grow up. I also thought working with adolescents would be easier than educating adults who already have strong mind sets.

Before I finish sharing my personal journey in social justice education, it is prudent to mention once again that the characteristics of privileged people who live in their own utopia are limited to a small portion of the population. As there always exists a good, bad, and ugly side, I have seen many generous people who are willing to help the oppressed. I would clarify that this research aims at influencing more people to be generous in the future who would collaborate for social justice, because two heads are better than one.

There is an old Chinese saying, 啐啄同時, meaning that the chick attempts to break the egg shell inside and at the same time the mother hen pecks on it to help the chick escape from it. When a chick is mature enough to get out of its egg, it attempts to break the egg shell inside. However, the egg is too strong for the chick to break alone. At that moment, the mother hen hears the sound made by the chick struggling and pecks on the shell to help it. Finally, the chick can get out of the egg. If the mother hen does not hear the sound of the chick trying to break its egg, it may result in dying inside. This saying implies the importance of humans nurturing and collaborating. A capable student can be a result of strong collaboration between a teacher and student. A happy family can

be achieved by strong collaboration between wife and husband. An ideal society can be made by strong collaboration between majority and minority.

Overview

The purpose of this study was to examine privileged middle school students' understanding of social justice. Based on a cumulative understanding of prior definitions of social justice, I first defined social justice in my own words as an essential process of equal access to material and participation through collaboration between peoples for the benefit of all. I then explained three theoretical backgrounds in the literature review in order to provide the importance and need for conducting this research: Teaching social justice with students from privileged groups, teaching social justice with middle school students, and teaching social justice through mathematics. All of this background information including my own definition of social justice and importance and need for this research eventually guided me to these three research questions:

1. What are privileged middle school students' understandings of social justice?

2. Based on their own understanding of social justice, what actions might middle school students from privileged groups be compelled to take?

3. What are middle school students' perceptions of mathematics as a lens to see inequality in real world income levels?

This chapter presents a discussion of the findings, conclusions, limitations and recommendations. Findings are discussed in light of my own definition of social justice

and prior research. In addition, conclusions, limitations and recommendations to future studies are made based on findings from this study.

Discussion

The findings from the results in accordance to three research questions are presented along with findings in comparison to prior research through my understanding and analyses of the data. Using three types of social justice-related topics such as class, gender, and ethnicity, I present findings on students' understanding about social justice with a discussion. Next, findings with possible actions students consider for making changes are discussed by comparing them with results from prior research. Finally, the findings are arranged and discussed on student perceptions on social justice mathematics lessons.

Students' Understandings about Social Justice

One of the important questions which I wanted to investigate in this study involves privileged students' perceptions on social justice. I specifically wanted to figure out how students from privileged groups respond to social situations which might work favorably for them in their future. In brief, the results showed that privileged students in this study saw inequality from the income data and identified possible underlying causes related to equity.

Before discussing results in regards to three major topics (Class, Gender, and Ethnicity), I found that the first topic, Class and Income, drew the least attention from

students. No student responded in writing about information on this topic when I asked them to write down three facts on what they had learned from the income information. This is likely a result from the lack of discussions regarding income levels with younger students. These discussions are not popular topics until students graduate from high school or college and actually make their career plans. For these reasons, I believe it is likely middle school students are not very interested in the topic.

Class and Income

Students were surprised at the income discrepancy and particularly felt bad about the income trend showing that people under the 10th percentile earned almost the same over 40 years. Their feelings of empathy were also represented in answers to the question asking how friends from the highest quintile might feel about a friend who is in the lowest quintile. These results substantiate that privileged middle school students were empathetic to people in poverty. In addition, the first statement specifically shows they were also able to find abnormally minimal trends in income. As middle school adolescents are known for being developmentally capable of engaging in complex issues (McDaniel et al., 2001), I think this result shows that privileged middle school students have the ability to recognize a social problem.

Even though students indicated education as the primary cause of different income levels, they also mentioned possible causes specifically for the minimal income change in the lowest income group. They mentioned unequal opportunities, discrimination, and having a disability as possible causes. In addition, more than half of

the interviewees disagreed with the statements that the primary cause of poverty is caused by people's own problems such as no strong work ethic and lack of motivation. I interpreted their responses to mean privileged students see unavoidable factors influencing some people's low income and sustainability over time. Especially when considering the two responses, unequal opportunities and discrimination, as highly thoughtful responses because the students had to infer from the data possible causes and at the same time these causes were related to the definition of classism.

In Chapter Two, I defined classism as a type of discrimination towards people in poverty and their access to resources controlled by a dominant group. I was surprised when students mentioned these two causes. This may have been a result from their learning about social issues in social studies, too.

Ultimately, I hope these students see opportunities for desired changes. Similar to medical doctors asking their patients questions to find out what originally caused pain before trying to fix it, students must recognize a problem first before taking action toward social justice. Providing a treatment to matters on the surface can never fully stop a similar situation from happening in the future, but it could close the growing gap between wealthy and poor by making changes to possible underlying issues.

Similar to Frankenstein's (1990) findings, no students in this study recognized that a cause might be class exploitation and corporations' exploitative activities. Even adult students in her research were not aware of these factual causes. Sigal (2010) demonstrates this public nativity of the privileged class toward exploitative activity in the

following statement taken from a handout at a meeting of Service Employees

International Union in Minneapolis, Minnesota:

> We clean some of the biggest corporations in the world: Wells Fargo, which made
>
> $3 billion in the last three months of 2009 alone, US Bank, which made $1.8
>
> billion last year, and Target, which made $2 billion last year...How long will we
>
> allow these corporations to use the recession as an excuse to make us settle for
>
> less and less, while they make more and more? Many janitors have seen their
>
> income cut by as much as 25% through wage reductions in the last two years and
>
> the cleaning companies are proposing to cut even more.

It seems natural for middle school students not to recognize class exploitation, because it

has not been a familiar issue to most grown-ups either. As in the Service Employee

Union above, they appear to be the only group aware of exploitation and see it as social

injustice.

In an effort to help the students in this study to see social injustice and

exploitation, they were asked what they thought about recent CEO bonuses in companies

that were bailed out by the government. The above question was originally developed

based on reading Haynes's (2009) statement below:

> In recent decades, our national conscience appears to have fallen asleep. Consider
>
> that in fall 2008, when credit dried up and the stock market fell, the government
>
> declared an emergency and provided billions of dollars to rescue Wall Street. But
>
> when millions of people go to bed hungry, lack health care or employment, and
>
> live in poverty and despair, there is no declaration of national emergency, no

bailout, no rescue plan, and no special session of Congress… No mater how

highly educated or sophisticated, a nation without a critical mass of citizens of

conscience may become indifferent to suffering and fall prey to tyranny and

intolerance. (p. 9)

By the teacher in my study using this discussion question, I was hoping to hear students

talk about a possible cause which might have contributed to the portion of people in the

highest (95th) percentile. However, all but one student in this study paid more attention to

the amount of the CEO bonus itself instead of focusing on the politicians in power

intervening because they directly benefited.

Prior research also showed that privileged high school students at a small private

boarding school focused more on the huge gap with upper income levels from the fourth

quintile to fifth quintile (Staples, 2005).

My students expressed disbelief … I think the median incomes of the fourth and

fifth quintile surprised them the most: They had thought that the fourth quintile

would be around $90,000 and the top quintile would have a median income closer

to $170,000.

However, the results in this research showed that middle school students did not pay

attention to the sudden increase in income differences in relation to the 4th and 5th

quintiles. I assume that middle school students' lack of knowledge in economics and

finance coupled with little discussion on salaries might influence their lack of interest in

this section of income difference by quintile. In the State of Idaho, students from 9th to

12th grades only cover economics in which they learn about basic economic concepts,

different types of economic institutions, and personal finance (Idaho State Department of Education, 2006).

Gender and Income

In this section, based on my definition of social justice, I wanted to answer how male students responded to the income data showing higher pay over females. My findings showed male students were surprised at the graphs and figures presenting income discrepancy by gender. When comparing the data between females and males, students made statements acknowledging income differences. For instance, the median income of females with an associate degree is lower than the median income of high school graduate males. The median income of males is at least a fourth more than the median income of females regardless of how much education.

While a couple of students said men might be more competitive at work and income difference might be uncontrollable, most students expressed feeling bad about the data. Beyond that, a few students did not understand why female students did not look more upset with the data. It was interesting that even male students did not believe it was fair to have the income gap by gender even though the data looked favorable to them. I think the results from students' interpreting data and sharing thoughts imply that the social justice lesson did raise their awareness on social issues and helped them develop a critical lens for recognizing oppression. This critical understanding was further supported when the male students were curious about why female students, as oppressed objects in the data, did not complain much more. These reactions confirmed my hope that male

students had strong feelings toward salary equity, even though they could benefit personally. This was affirmed from the results that middle school students do have a sense of morality and want to make things right.

Students also talked about possible causes of gender income discrepancy when they were interpreting the data. Even though a couple of students selected personal decision as a cause to lower median income of women, a majority of students thought that limited opportunities for women due to physical condition, stereotypes about the traditional role of females, and discrimination (e.g. hiring bias) might influence the lower income of women in relation to men. It was also discovered that most students considered attitude change to traditional gender stereotypes and equal opportunities a possible solution toward attaining more reasonable income data by gender. These results showed me that middle school students are also able to see underlying inequalities existing in society, which is a connection the adults in Frankenstein's (1990) study failed to make. In her own words:

> Although many of my adult students are aware of race and gender discrimination, they often view these injustices as personal problems rather than as problems woven into the institutional fabric of our society. The statistical picture of race and gender inequalities emphasizes that, most often, personal situations are not unique and not the result of individual failure; rather, they are due to the failure of our society to ensure equality and justice for all. (pp. 343-344)

By comparing the results in this study with Frankenstein's (1990), I believe that young adolescents' thoughts are as powerful or more powerful than adults when interpreting

data. I think middle school students learning activities in social studies curriculu, such as human rights, might influence their ability to see underlying issues. Moreover, I would like to emphasize the results from my study and other researchers found middle school students could identify some possible reasons for women's limited roles in society (Weiler, 2008a, 2008b).

Ethnicity and Income

As in the prior two topics, my question was investigating the possibility of white students working toward social justice even though the data shows them at a possible advantage. I made this conjecture based on my definition of social justice and whites being privileged in this country according to Goodman's (2001) criteria.

The results showed that there were two different types of student responses to the data showing income discrepancy by ethnicity: Surprise at white's income not being the highest and surprise at income discrepancy across ethnic groups. First, students were surprised and curious why whites, which is their same ethnicity, make less than Asians. I think this result is natural in that people tend to pay attention to facts related to themselves, because I as an Asian, also made similar comparisons when I was developing lesson plans for this research. The second curiosity was related to comparing whites to the other ethnic groups' household income. Even though I expected students to find different household income according to ethnicity, it was interesting to hear from some students that the data did not look too bad even though whites were not the highest. I assume this result reflects some middle school students already had knowledge about

racism in society from prior learning in their social studies curriculum that covered the Holocaust and Civil Rights Movement. I also feel good that data in my social justice lesson plans did raise students' awareness on social issues.

When talking to students about their feelings, all students regardless of views, showed sympathy to different ethnic groups who had less income. I would interpret this result as these students having a socially conscious mind. It is also possible that these and other privileged students have awareness and are sympathetic to social issues even though they may have benefitted from the social situations.

Additionally, most students in this study indicated racial prejudice and hiring bias as possible causes to the income discrepancy. Students also discussed different racial prejudices toward different ethnicities. Some of them shared their knowledge of stereotypes on African Americans and Hispanics being undervalued and discriminated against. Others talked about positive stereotypes toward Asians regarding their high income. These results helped me to conclude that middle school students were also able to find possible underlying issues to different income levels by ethnicity such as prejudice and stereotypes existing in society. The findings in this section also guided me to conclude that this study also supports prior research showing students discovering discrimination toward minority ethnic groups (Tatum, 1994).

Possible Actions to Consider Taking

In this section, I was eager to explore possibilities of privileged students working toward social justice from the data. I thought privileged students working for justice

could be a big support to minority people striving for social justice. This could eventually mean collaboration across social classes. At this point, I would like to clarify that the meaning of collaboration in my own definition of social justice does not only refer to working together to achieve social justice, but also means privileged students working by themselves to do so. I believed the public demographic income data used in this study might provide privileged students with opportunities for working toward social justice, even though they might benefit from the situation shown in income discrepancy in the future.

At the end of each topic (Class, Gender, and Ethnicity), students were asked what types of actions they wanted to take if they, as 7th graders, believed they could do something to change possible causes in the income discrepancy. While a small portion of students answered either they had no idea what to do or they could not do anything because people would not listen to young students like them, the majority of students shared various actions which they could take. Some students wanted to contact people in power by writing letters and sending petitions to fix the problems shown in the data. Protesting was also often mentioned as an option to help other people become aware of the issues. These same participants stated protests could result in society working for more reasonable income equity. Yet other students would like to wait until they become adults and then take actions when they have a voice. Had I given the students specific examples of youth social actions, I believe more students would have stated some social action they could have taken.

Historically, there are many cases in which young people stand up for inequality and fight for change and their rights. For example, in 1919, there was an 18-year-old high school girl in Korea, Kwan-Soon Yu, who was one of the people leading a big protest in her hometown for independence from Japan occupying Korea. She felt she needed to risk her life rather than live a good life as an intelligent woman in her determination to gain independence from Japanese oppression. Eventually she was tortured to death by Japanese policemen. Present day Koreans still remember her heroic spirit of sacrifice. People in Korea appreciate her and others' fight for independence. Koreans still feel strongly to this day that the Japanese government should formally apologize for their savagery to Koreans that included teenaged female sex slaves, forced laborers, and unrelenting oppression.

In the United States, many students also enthusiastically took actions for their rights. For example, 16-year-old Barbara Rose Johns was a student attending Moton High School, a school for only African American students in Virginia. Moton High was overcrowded and run down, clearly unequal to the whites' schools. To bring about changes, Barbara organized a protest march with her classmates to ask for an equal facility to all the white schools. Changes did not take place right away, but this case made its way to the Supreme Court and eventually joined the famous case of Brown vs. Board of Education causing a decision that racial segregation in public education is illegal. This student also knew her future was uncertain, but she was not afraid of taking actions for change.

In another case, Lau v. Nichols, Chinese students in San Francisco claimed they were discriminated from receiving special help in school due to their limited English proficiency. In this case, the U.S. Supreme Court ordered that all students, including minority language students, had rights to be treated equally in all schools (Russo, 2006). Even though my study did not follow students for a longer period of time to see the results from their intended actions, there is evidence as indicated in the above examples that students can cause change.

Regarding the examples of young people's contribution to society, Levine (2009) further asserts that young people should address the complex problems in society and serve to make changes. I feel the three reasons for young people to take part in social issues that he purports are important.

1. Young people who are active with social institutions do better in life. They are more likely to stay in school and out of trouble. Participation in community groups can even reduce teen pregnancy.

2. Youth have different interests than older people, and someone needs to represent those interests. For instance, Social Security is a bigger issue for senior citizens than for youth and therefore gets disproportionate attention from politicians. The unemployment rate for people ages 16-19 is above 20 percent, but candidates rarely talk about unemployment as a youth problem – because working-class youth don't vote enough.

3. We need young people's energies to address the complex problems that will face us in coming decades. The United States has never overcome any major

challenge without unleashing the skills, energies, and passions of millions of

citizens. Collaboration is the genius of American democracy … People are

less likely to work on community projects than they were a generation ago. If

we want to turn this decline around, we must focus on youth. Very few

programs, projects, or even movements have changed passive adults into

active citizens. (Levine, 2009, pp. 22-23)

I also agree with Levine's (2009) reasons, however, I would like to put more emphasis on

the third statement because it also includes my definition of social justice as an essential

process of equal access to material and participation through collaboration between

diverse peoples for the benefit of all. This is why it was important for me to do this

research. My study showed that middle school students are empathetic and were willing

to take action based on their statements about possible solutions.

The results in this study would support that teachers do need to take a role in

raising awareness to social justice action. Seider (2009b) maintains that it is critical for

teachers to develop lessons which help students better understand social problems and to

find solutions to those problems. He also asserts that students could show more

commitment to social action when they are not overwhelmed by the size and scope of

social problems (Seider, 2009a, 2009b).

Additionally, results from my research also supported the idea that middle school

students are willing to work against discrimination as found in earlier studies by

McEady-Gilliad (1994) and Quintana (1998). However, the results from this study were

different with Arnett's (2004) and Seider's (2008) findings on high school students, who

found these students to be very self-centered and pay less attention to others or consider a possible commitment to other people. In contrast, this study found middle school students to be empathetic and considerate of helping others. I believe this different attitude in taking actions for social justice between middle and high school students is because of an increased focus on college and career plans for high school-aged students. Middle school students appear to have a stronger sense of morality.

Students' Perceptions on Mathematics Lessons for Social Justice

When students were asked to share their feelings about mathematics lessons with income data interpretation, a majority of students answered that they were interested in and excited about social justice mathematics lessons. This finding was interesting to me because it appeared that students had a hard time dealing with big numbers during lesson procedures. However, a few others did not feel any difference between social justice lessons and regular mathematics lessons because both of the lessons dealt with numbers. They disliked mathematics. This result is similar to Brantlinger's (2005) discovery that some students were reluctant to work on mathematical problems because it is just mathematics.

More than half of the students considered social justice mathematics lessons more interesting because they learned about real-world applications. In addition, students in my study wanted to have more mathematics classes with similar content. I would like to emphasize this result, because social justice lessons can change students' orientation of mathematics. Prior research describes teaching mathematics for social justice provides

students with not only the knowledge helping them strive for a more equitable society,

but also opportunities to change their orientation toward mathematics (Boaler, 1998;

Gutstein, 2003, 2006a, 2006b, 2007a, 2007b; Gutstein & Peterson, 2005; Tate, 1995).

Like prior research, this study also supports students' change toward mathematics. I

assume this result of changed attitudes can be also replicated in other subject areas if the

theme of social justice is integrated with them. Moreover, students in this study talked

about an interdisciplinary approach with social justice topics (Bell, 2007) across other

subject areas.

Conclusions

Based on findings from this research and discussions, I have determined that

privileged middle school students can contribute toward social justice. In Chapter Two, I

defined social justice as an essential process of equal access to material and participation

through collaboration between diverse peoples for the benefit of all. At this point, I would

like to conclude this study by clarifying the importance of social justice education and

education towards caring for others.

First of all, social justice education should be considered by educators because

they can play an important role toward helping students develop their sense of morality.

Haynes (2009) maintains that educators can be exemplars by practicing "honesty, service,

responsibility, and compassion" and by telling students that even a single and small act is

valued. At the same time, education (especially social justice education) can promote

students' moral development through continuous attempts in engaging them in discussing

and reflecting societal issues. This endeavor also needs to be an ongoing process because people do not automatically achieve attitudes of helping others in need. According to Levine (2009), K-12 education has an important duty to support civic engagement.

Particularly, social justice education could be more applicable to students from privileged groups. This is why social justice education has a higher possibility for implementation by utilizing resources that are normally only available at privileged schools and thus also a higher chance to affect future social justice (Levine, 2009).

In addition, educating students (particularly students from privileged groups) about helping other people they do not know is also important, because people can make an ideal society by strong collaboration between the majority and minority. Haynes (2009) shares an example of two strangers helping each other through his experience traveling in Yad Vashem, Israel. His travel guide told him about a German man secretly helping the guide's father survive in Auschwitz. This example implies there are people who will sacrifice themselves for people they do not even know. Haynes (2009) also shared a story about a female student who took a world history course at César Chávez Public Charter School in Washington D.C. resulting in a change of attitude toward people who live far away. She reported that she became aware of people starving in Africa and knew she could do something in her own community to help. The following is a good quote that I believe to be the essence of serving other people.

> During our lives, each of us faces a choice: to think only about yourself, to get as much as you can for yourself, or to think about others, to serve, to be helpful to those who are in need. I believe that it is very important to develop your… heart,

> to have a heart open to the suffering of others. (Ritter & Meyers, 1986, p. 65, as
>
> cited in Haynes, 2009, p. 9)

With my findings, I strongly believe that educators who implement social justice education can help students realize they too can be a part of change for the betterment of others.

Finally, I would like to share a personal story about social justice from my native country, Korea. The former president, Mr. Moo-hyun Roh, lived his life to bring social justice and democracy. He was originally from a working class family and self taught himself enough law to pass the bar exam. When working as a busy lawyer and becoming very successful, he started taking on clients who were labor workers and defended them in lawsuits. Eventually, he quit his law practice and dedicated his life to working for the oppressed and fighting for social justice. The history of his struggle for social justice after giving up his privileged status moved Korean people, especially the young generation. These young people helped him become the first Korean president from a working class family. His idea for a just society became more prominent as a new politician and novice congressman. His voice came through loud and clear as he made his way in the Democratic Party as noted in the following speech.

> The ideal society of which I dream is where diverse people live harmoniously.
>
> People have equal access to materials, people are not discriminated against and all
>
> individuals live joyful lives every day and anticipate the next day with happiness.
>
> I hope to live in a society where people in the lower income class do not choose
>
> death just because they have a hard time making a living and the status quo

prevents them from enjoying a happy life. I look forward to living in a society where working class people can also get respect. People with lower educational attainment should be treated equally, and income discrepancy should not divide social classes (Roh, 1988, as translated by Jang, 2010).

When I studied his philosophy and learned what he had done for social justice, I thought he would be a very good example of someone who fits with my reasons for conducting this dissertation research and for my future research goal. Just as he strived to realize social justice for society despite his privileged status, I too hope social justice education, especially in Korea, can provide all students, particularly students from privileged groups with educational opportunities, to help work for social justice and a society with harmonious coexistence.

Limitations

As in all research, there were limitations to this study, too. A few limitations are discussed for this research. First, participants might not be a perfect fit for students from privileged groups in terms of economic status. I selected the project school for this study because of the fact that the school did not provide free or reduced lunches and transportation. Free or reduced lunches is one of the indicators used for determining a school's socio-economic status. This fact helped me make a reasonable assumption that socio-economic status of the students' parents was at least middle class, but it is also possible for parents from the lower income class to send their children to this public charter school. In fact, over the duration of the study, I witnessed a couple of cases where

parents removed their children from the school and transferred them to other schools which provide transportation and meal services. Given this possibility that some students would qualify for free or reduced lunch in another school setting, it may not be appropriate to assume all students in this study were from privileged groups.

Second, the limited amount of time for this study should be considered. Even though I spent one semester in participants' classrooms for this research, the actual amount of time was not long enough to witness students' actions due to the cooperating teacher's own curriculum schedule. In fact, social justice lessons were implemented on four different days and interviews were conducted over two weeks. The timeline for this study may have limited the possibilities of students' responses and actions.

Third, my status as a non-native English speaker may have restricted building a higher degree of rapport with participants. I volunteered as a teaching assistant prior to and during this research to build rapport and trust for the study. Even though the participants welcomed this study and me, I may have gotten richer discussions if I had been their primary teacher and spoke fluent English. I also wish I looked "normal" to them like their friends and family. Had I been Caucasian, it is possible they might have responded differently.

Recommendations

Results from this study and personal reflections have helped me arrive at some recommendations and suggestions for further inquiry. First, I recommend more coursework and inservice training that focuses on social justice issues. When I developed

social justice themed lesson plans and shared them with the cooperating teacher as a place to begin talking about the possibility of conducting this study, she was excited about using the lesson plans in her class. This conversation was also timed with the fact that the teacher had just finished reading the article I had provided, "M4K1NG NUM3ER5 COUNT: How social justice math can help students transform people, politics and communities," from the spring issue of *Teaching Tolerance* (Murrey & Sapp, 2008). I provided a copy of the article in an initial meeting to help explain the concept and importance of teaching for social justice in mathematics and to encourage her to accept my research proposal. During the extent of the study, the teacher continuously expressed appreciation for the opportunity to teach social justice. She also enjoyed students' responses during the research period and frequently asked what I learned from the students' reflection papers and interviews. In addition, the principal in this school became interested in this study and gave me thoughtful feedback on the lesson plans prior to conducting this study in the school site. Based on the enthusiastic response from both teacher and principal, I inferred they liked the idea of incorporating social justice in the curriculum. This response from one school site may show a need for social justice issues taught in other schools and with preservice teachers. Bullock (2004) also mentioned the importance of social justice curriculum development for educators:

> What I am advocating is teacher education that infuses issues of power, privilege, and oppression into teacher education classes and field experiences. As Belle and Esperanza suggested, being in the classroom is different. This means we need to incorporate structured and guided experiences for preservice teachers to have

classroom experiences while considering critical diversity issues. This also means

providing professional development opportunities, such as courses or workshops,

for inservice teachers to explore these issues. (p. 154)

From my study and others, I think there is strong evidence to put emphasis on developing

courses for social justice education.

My second recommendation is that real-life data should be translated into a

format that matches the level of students in the various grade levels. When interpreting

the data, some students tend to translate the information into just one person or two

people comparing it between two individuals as opposed to two groups. For example, in

this study, the graph on Ethnicity and Income caused some students to think of individual

African Americans and whites that they personally knew versus the ethnic group as a

whole. Some students were also unable to infer that this graph did not represent every

black citizen, because there are some individual African Americans who make more than

whites as a group or any ethnic group. For this reason, I assumed that it might have

resulted in more thoughtful feedback after students had a better understanding of

statistics.

The third recommendation is social justice lessons may help the unmotivated

students, as prior research also shows (Boaler, 1998; Gutstein, 2003, 2006a, 2006b,

2007a, 2007b; Gutstein & Peterson, 2005; Tate, 1995). When doing my observations for

this study, I was able to notice differences in students' participation in the discussions.

The cooperating teacher was also surprised at some students' different attitude toward

social justice lessons. Some students who had been less vocal in the regular mathematics

lessons actively shared ideas and thoughts including mathematical problem solving processes with the social justice lessons. One particular student used to look uninterested and bored with the regular lessons and sometimes disrupted the learning environment with excessive noise. When this occurred, a male paraprofessional teacher always sat down next to him and helped him focus on lessons. This did not happen with this student during the social justice lessons. This change in student engagement might imply that real-life examples with social justice education help unmotivated students become interested in learning.

My fourth recommendation is that social justice lessons may be more effective over a longer period of time or embedded into the curriculum for at least one semester or an academic year. Even though the school in this study puts much emphasis on character education and service learning, it seemed hard for the cooperating teacher with her own curriculum plans to participate in this research project in the era of high-stakes tests. This study was originally planned to be conducted in 2008, but the cooperating teacher was busy due to her own schedule and plans for state-wide mathematics assessment. The teacher also had a hard time adjusting her curriculum schedule for this research project in the following year, however, she made a sacrifice and collaborated with me for the benefit of her students, especially after she understood the need, importance and possible effects of this study. Even though the teacher accepted my proposal, only four days of instruction in a certain time period were allowed for social justice lessons. Given the limited number of lessons, students were able to take time investigating all the tables and figures, but could not share their thoughts on all discussion questions. I believe this study

could have gotten even stronger results (even actual actions taken by students during this study) with a longer period. Ideally social justice research should take place long enough to witness participants rising to the level of taking real actions. I only got to witness their stated intentions in this study due to the limited time.

My final recommendation is that social justice should be taught across all disciplines. In this study, one student directly indicated an interdisciplinary approach of social justice lessons while some other students said that topics and contents in social justice mathematics lessons were similar to those in different subject areas. When the particular student talked about his thoughts on social justice mathematics education, he answered that social justice lessons reminded him of certain knowledge which he learned in the other subject areas. The student also responded that he actually had an opportunity to revisit the topics from a World War II and Civil Rights study during his participation in this study. These results may imply that interdisciplinary teaching for social justice can help students become more engaged in learning.

In summary, the following are my recommendations:

First, more coursework and inservice training should focus on social justice issues.

Second, real-life data should be translated into a format that matches the level of students in the various grade levels.

Third, social justice lessons may help the unmotivated students.

Fourth, social justice lessons may be more effective over a longer period of time or embedded into the curriculum for either at least a semester or an academic year.

Finally, social justice should be taught across all disciplines.

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APPENDIX A

Social Justice Lesson Plans for This Dissertation Research

Class Period: _____   **Name:** _____

**Income in the United States
Looking at Trends**

Topic 1: Class & Income

Vocabulary

Percentile: one of hundred segments of a distribution that has been divided into hundreds.
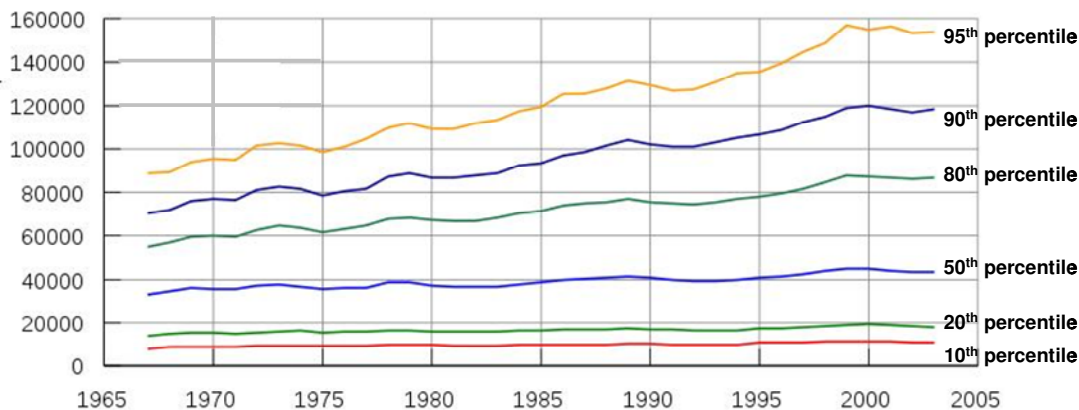

Figure 1. United States Income Distribution 1967-2003

Use the data in Figure 1.

1. The income of 10th percentile is what fraction of the income of 95th in 1970?

2. The income of 10th percentile is what fraction of the income of 95th in 2000?

3. Compare results between Question 1 and Question 2.

Vocabulary

Mean: the *mathematical average* for a set of data.

Quintile: one of five segments of a distribution that has been divided into fifths.

Table 1. 2007 Mean Annual Household Income by Quintile

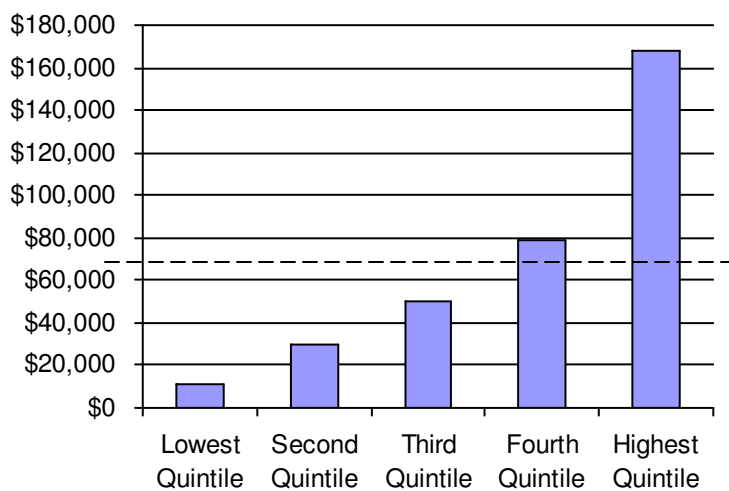|	
Lowest Quintile	$11,551
Second Quintile	$29,442
Third Quintile	$49,968
Fourth Quintile	$79,111
Highest Quintile	$167,971

* Mean income: $67,609

Figure 2. 2007 Mean Annual Household Income by Quintile

Use the data in Table 1.

1. The mean income of the lowest quintile is what fraction of the mean income of the highest?

2. The mean income of the second quintile is what fraction of the mean income of the highest?

Discussion Questions

1. What are some reasons for different income levels?

2. What questions might a family in the lowest quintile have about a family in the highest quintile?

3. How might friends from the highest quintile feel about a friend who they learn is in the lowest quintile?

4. In what quintile do you think your family belongs?

5. Recently there has been a lot of discussion on the news about CEO bonuses in banks and companies which were recently bailed out by the government. What do you think about the CEO bonus debate?

Should any CEO's get a bonus?

- If yes, under what conditions?

- If no, how would you reward a CEO who brings the company out of difficult times into

a profit margin?

6. As a 7th grade student, do you think you can do something to change this problematic

situation in the United States? If yes, what kind of actions do you want to take?

TOPIC 2: Educational Attainment & Income

Vocabulary

Median: the *middle number* of a set of data that is ordered from lowest to highest.

Table 2. 2003 Median Income of all households with a householder 25 Years Old and Over by Educational Attainment

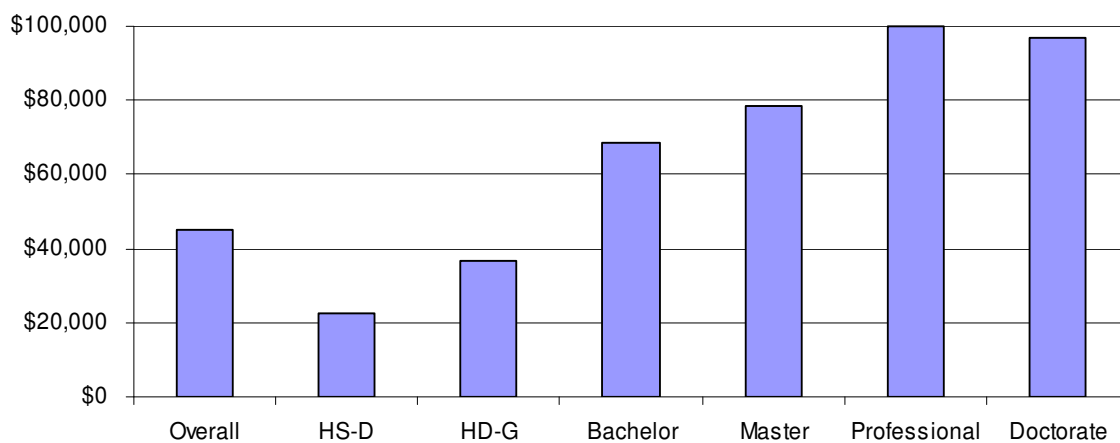| Overall Median	High School Drop-out	High School Graduate	Bachelor's Degree	Master's Degree	Professional Degree	Doctorate Degree
$45,016	$22,718	$36,835	$68,728	$78,541	$100,000	$96,830

Figure 3. 2003 Median Income by Educational Attainment

Use the data in Table 2 to fill in the blanks to create an accurate statement.

1. The median income of the high school drop-out is what fraction of the median income of the doctorate?

2. _____ and _____ make less than the overall median.

3. What other comparisons can you make using this data?

Discussion Questions

1. What do you think about this data? Is it reasonable for people with higher educational attainment to make more income than people with lower educational attainment? Why or why not?

2. How high of a degree do you plan to earn? Do the income levels in Table 2 influence your thoughts?

Class Period: _____   **Name:** _____

Income in the United States - Looking at Trends

Topic 3: Gender & Income

Table 1. 2004 Median Income of Persons 25 Years Old and Over by Gender

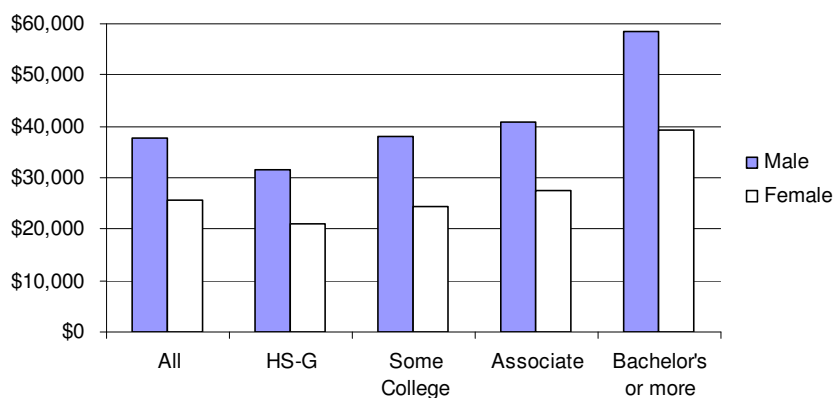|	All Workers	Less Than 9th Grade	9th to 12th Grade (no diploma)	High School Graduate (includes equivalency test)	Some College (no degree)	Associate's Degree	Bachelor's Degree or More
Male	$37,669	$20,100	$22,255	$31,624	$38,186	$40,879	$58,362
Female	$25,809	$12,541	$13,951	$20,928	$24,586	$27,396	$39,330

Figure 1. 2004 Median Income by Gender

Use the data in Table 1.

1. The income of females with an Associate's degree is what fraction of the income of males with the same degree?

2. The income of females with a Bachelor's degree or more is what fraction of the income of males with the same degrees?

3. What other comparisons can you make with this data?

Table 2. 2008 Median Earnings in the Past 12 Months of Full-Time, Year-Round Workers Aged 16 and Older by Gender and Women's Earnings as a Percentage of Men's Earnings by State

Area	Median earnings		Women's earnings as a percentage of men's earnings
	Men	Women	
United States	$45,556	$35,471	77.9%
District of Columbia	$57,393	$50,519	88.0%
Idaho	$41,461	$29,730	
Montana	$38,440	$29,634	77.1%
New York	$48,882	$40,490	82.8%
Utah	$45,028	$31,183	69.3%
Wyoming	$48,555	$31,204	64.3%

Use the data in Table 2.

1. Please fill in the blanks in the Table.

2. How many areas are there where women's earnings as a percentage of men's earnings are higher than it in the United States?

3. How many areas are there where women's earnings as a percentage of men's earnings are lower than it in the United States?

4. How are women's earnings as a percentage of men's earnings in Idaho?

Table 3. Earnings in 1999 of Full-Time, Year-Round Workers, by Gender in Our Community

Area	Male						Female					
	Workers with earnings	Median earnings in 1999	Earning in 1999				Workers with earnings	Median earnings in 1999	Earning in 1999			
			$1 to $24,999 or loss	$25,000 to $49,999	$50,000 to $99,999	$100,000 or more			$1 to $24,999 or loss	$25,000 to $49,999	$50,000 to $99,999	$100,000 or more
Idaho	232,696	$32,603	72,073	104,176	46,490	9,957	135,547	$22,939	75,192	49,664	9,432	1,259
Ada County	63,859	$37,867	15,493	27,171	16,937	4,258	40,760	$26,453	18,290	17,521	4,273	676
Boise	53,476	$37,349	13,161	22,999	13,837	3,479	34,742	$26,219	15,831	14,855	3,511	545
Eagle	4,789	$44,310	865	1,806	1,586	532	2,738	$29,538	1,605	1,154	412	107
Kuna	1,873	$36,744	514	899	414	46	1,066	$24,058	559	412	87	8

Use the data in Table 3.

1. What is the percentage of male workers making $100,000 or more compared to the total in Idaho?

2. What is the percentage of female workers making $100,000 or more compared to the total in Idaho? Compare the result with the one in Question 1.

3. What is the percentage of male workers making less than $50,000 compared to the total in Boise?

4. What is the percentage of female workers making less than $50,000 compared to the total in Boise? Compare the result with the one in Question 3.

Discussion Questions

1. Why is there a discrepancy of income level between males and females with the same educational attainment in Table 1?

2. (**Females respond to these questions**) How does this information make you feel? What solutions would you propose for addressing this discrepancy?

3. (**Males only respond to these questions**) How does this information make you feel? Should this discrepancy be protected? Why or why not? What solutions would you propose for addressing this discrepancy?

4. As a 7th grade student, what do you think you can do to change this discrepancy? In what ways?

Class Period: _____   **Name:** _____

Income in the United States - Looking at Trends

Topic 4: Ethnicity & Income

Table 1. 2007 Mean Household Income of Householder by Ethnicity

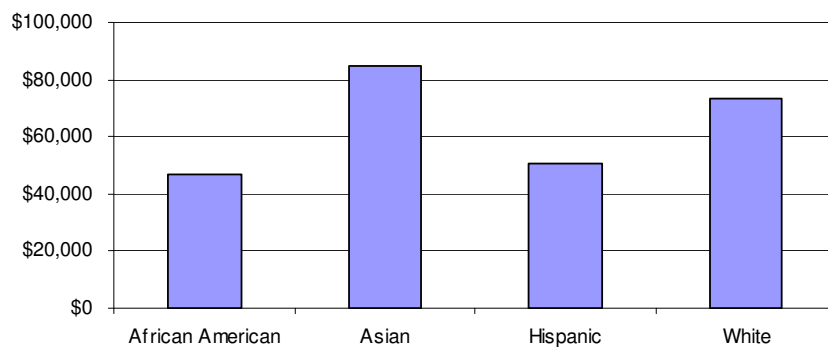| African American	$46,831
Asian	$84,561
Hispanic	$50,828
White	$73,132

* Mean income: $67,609

Figure 1. 2007 Mean Household Income of Householder by Ethnicity

Use the data in Table 1.

1. The mean income of African Americans is what fraction of the mean income of Asians?

2. The mean income of Hispanics is what fraction of the mean income of Whites?

3. The mean income of Asians is about _____ times the mean income of Hispanics.

Table 2. 2005 Pacific Northwest Median Household Income by Ethnicity

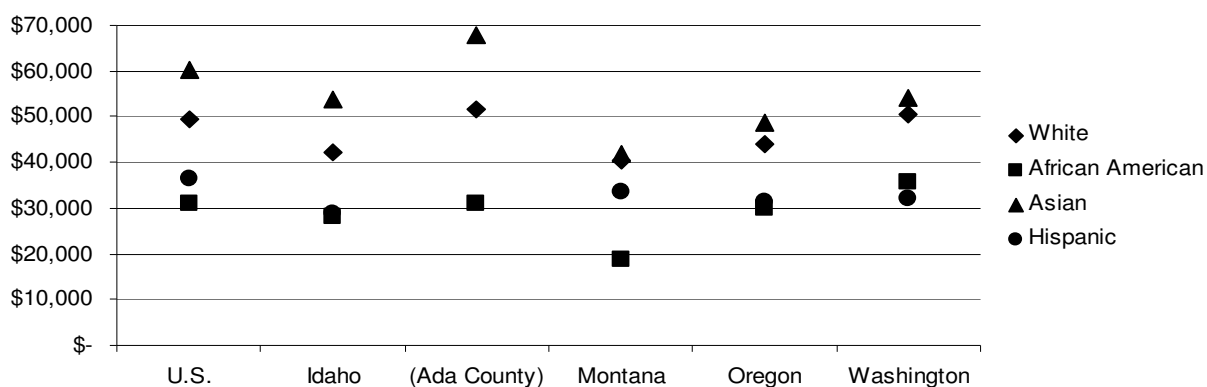|	U.S.	Idaho	(Ada County)	Montana	Oregon	Washington
White	$49,453	$42,236	$51,716	$40,354	$43,880	$50,678
African American	$30,939	$28,027	$31,159	$18,854	$29,819	$35,613
Asian	$60,367	$53,899	$67,681	$41,838	$48,823	$54,276
Hispanic	$36,278	$28,812	No data	$33,604	$31,432	$31,968

Figure 2. 2005 Pacific Northwest Median Household Income by Ethnicity

Use the data in Table 2 to fill in the blanks to create an accurate statement.

1. In the United States, the median household income for white households is $49,453 but only _____ for black households - a difference of nearly _____.

2. In the State of Idaho, the median household income for Asian households is _____ but only _____ for Hispanic households - a difference of nearly _____.

Discussion Questions

1. What thoughts do you have about this information on income levels by ethnicity?

2. Why do you think there are differences of income levels between ethnic groups?

3. Thinking about the ethnicity of your parents, what are your thoughts about ethnic groups that make more income and ethnic groups that make less income?

4. As a 7th grade student, do you think you can help change this discrepancy? If yes, in what ways?

Class Period:_____   **Name:** _____

Income in the United States - Looking at Trends

Finishing Reflection Questions

Please respond to each question using complete sentences.

1. Write down three facts about the income information that you learned from the tables and figures.

2. When your teacher had you discuss issues related to income levels, what understanding or awareness did you gain about different income levels and possible causes in U.S. households?

3. Can you explain how your thinking or awareness of income issues might have changed or stayed the same?

4. What did you hear from your classmates that surprised you or made you think about your own understanding of inequality? Were there statements that made you angry? Please explain your answers to these questions.

5. Do you think it is important for our society to work on the problem of income inequity? Why or why not?

6. What do you think you could do in the future to solve problems of income inequity? Please explain your answer.

7. How much do you like mathematics? Please indicate a number of degrees ranging from 1 to 10. Ten means you like mathematics very much.

- Could you explain why you like mathematics that much?

8. What did you think of mathematics when you interpreted the data in the tables and figures? Did you learn something new about our society?

- Was mathematics more interesting than before? Did you feel the same before and after? Were you bored? Please explain why you responded in that way?

APPENDIX B

Lesson Procedures

In this appendix, I describe how the lessons were implemented day by day. The procedure for each lesson includes introduction to the data by the teacher. Students then answered questions on their reflection papers and had a class discussion on their interpretation of the data. This section does not include results.

Day One

During the first day of the research, the cooperating teacher presented mystery data which had no numbers in it as shown in Figure 3. Based on experiences from the pilot study, the teacher and researcher agreed that mystery data could better draw students' attention to the lesson.
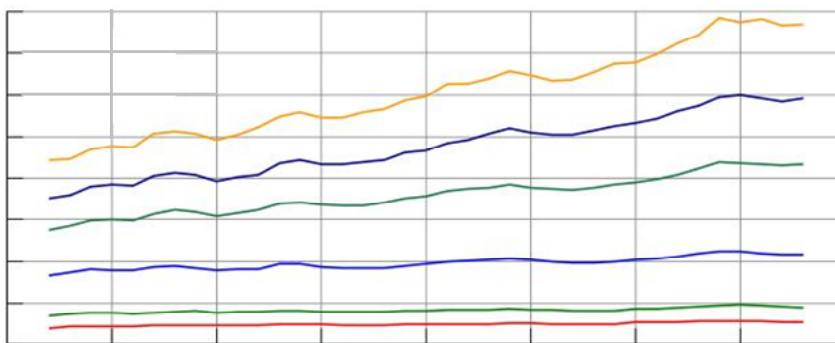
Figure 3. Mystery Data in the Lesson Plan for Class

The teacher asked students, "What could this data represent? What in the real world might this data represent?" (Audio transcript, Monday October 26, 2009). The teacher also encouraged them to share hypotheses which some students had after they looked at the mystery graph. Some replied:

The higher up the starting point, the higher it goes.

Maybe it is something that changes height over time?

Maybe it has to do with the stock market?

I thought it represented what happens when a volcano erupts.

Maybe it's about the weather?

Speed of race car drivers?

It seemed that students were excited to talk about what they thought of the mystery data. Then the teacher added another piece of information about the graph which was presented in Figure 4.
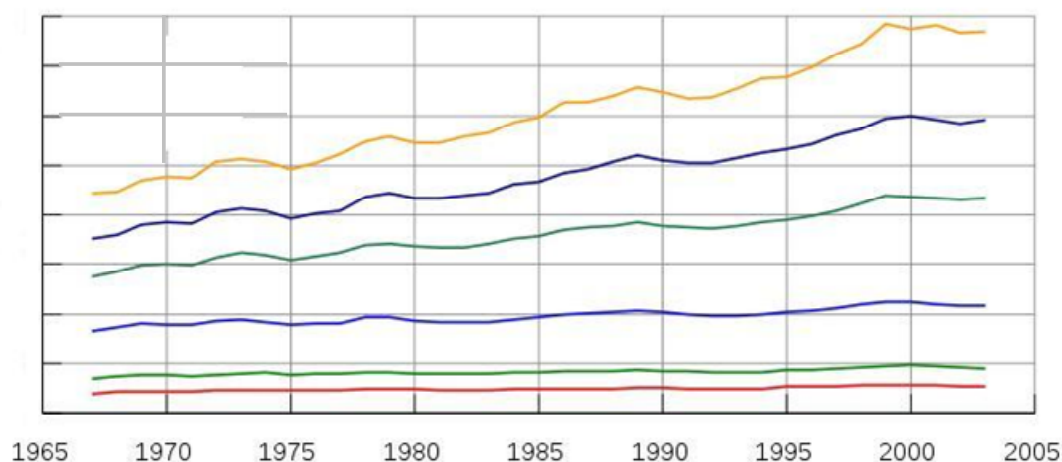
Figure 4. Mystery Data with X-axis in the Lesson Plan for Class

As soon as information on the X-axis was added, the teacher asked students, "Now with this information, what do you know more about the data, now that you've seen the X-axis?" (Audio transcript, Monday, October 26, 2009). A few students responded:

Maybe it is the sales of a few companies.

I thought it could be the sales from different companies. One line could be a company or maybe the lines could be different products within the same company.

I think it could be earthquakes in different areas over time.

The teacher also asked what the numbers in the X-axis possibly meant to students. One student answered it might be years, in which other students agreed that the X-axis represented years. After a while, it was confirmed that students were correct, and a statement was made that the graph was broken up into 5-year increments going from 1965 to 2005. Finally, the teacher showed the original graph drawn in the first lesson plan. However, the teacher did not tell students yet that the graph was about the United States Income Distribution.
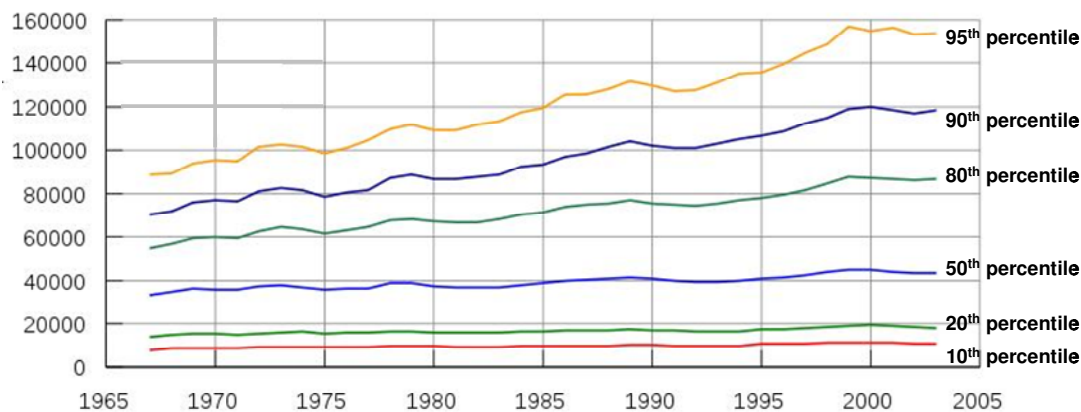

Figure 5. United States Income Distribution 1967-2003

Presenting the graph, the teacher described to students that the Y-axis starts at the bottom with 0 and goes up to 160,000 and on the right side the lines labeled as the 10th

percentile go up to the 95th percentile. Then the teacher asked what the numbers in the Y-axis in Figure 5 could mean. Students gave answers such as money, shares sold, and stocks. The teacher also asked students what the graph might describe. One student responded:

> My hypothesis to the graph is that it could be sales of different branches of the same company.

After sharing possible hypotheses from graphs with mystery data, the teacher finally revealed that the graph was the U.S. household income from 1967 to 2003. At that point, the teacher made clear that household income counted not only salaries, but also earning from the other possible sources such as investment and rental receipts. Then students had discussions on what they noticed in Figure 5.

Followed by a series of dialogue, students were given some time to work on mathematical problems related to the data in Figure 5. Since actual numbers in Figure 5 were not presented, students used approximate numbers. Each mathematical problem was developed to help students find the difference and ratio between various income levels. Even though I planned to investigate students' mathematical abilities over the study, it was discovered by the teacher and me that more than half the students felt embarrassed to deal with fraction problems in numbers bigger than 1,000. Thus, we agreed that it may not be worth writing down the problem solving process of mathematical problems in the dissertation, even though the teacher asked it to students and shared the process and correct answers. Regarding the graph in Figure 5, students were asked to answer three mathematical questions below.

1. The income of 10th percentile is what fraction of the income of 95th in 1970?

2. The income of 10th percentile is what fraction of the income of 95th in 2000?

3. Compare results between Question 1 and Question 2.

As students had already engaged in a discussion of the "United States Income Distribution from 1967-2003" before doing mathematics, they proceeded to work on the next data set in Figure 6, "2007 Mean Annual Household Income by Quintile." In order to help students compare numbers and do mathematics easier, a table with exact numbers in it was also given. The data and mathematical problems are as listed below.
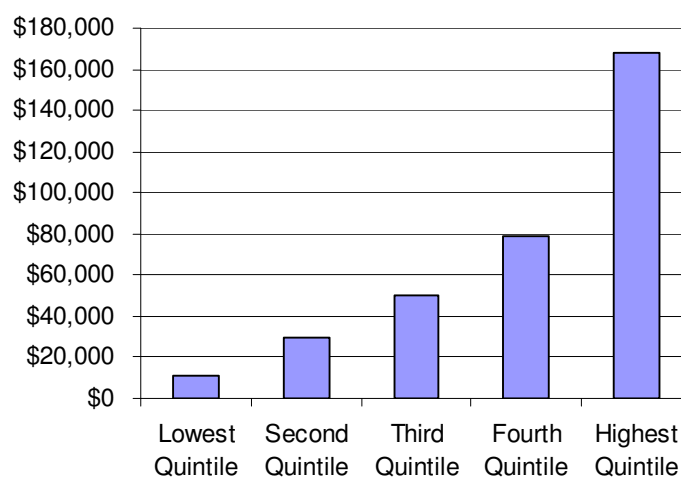

Figure 6. 2007 Mean Annual Household Income by Quintile

Using the data above, students compared mean incomes between different quintiles.

1. The mean income of the lowest quintile is what fraction of the mean income of the highest?

2. The mean income of the second quintile is what fraction of the mean income of the highest?

While taking their time doing the mathematics, students were also asked to write down their reflections for the first four discussion questions listed below.

1. What are some reasons for different income levels?

2. What questions might a family in the lowest quintile have about a family in the highest quintile?

3. How might friends from the highest quintile feel about a friend who they learn is in the lowest quintile?

4. In what quintile do you think your family belongs?

After students worked on both fraction problems and discussion questions, the teacher continued to facilitate dialogue with students. She asked students, "What did some of you put down for what some of the reasons for the income levels are?" (Audio transcript, Monday, October 26, 2009). After students shared ideas regarding the question for awhile, the teacher talked with students in regards to what was interesting about the trend in the last 40 years. Then, students had two discussion questions left in the first lesson plan as below.

5. Recently there has been a lot of discussion on the news about CEO bonuses in banks and companies which were recently bailed out by the government. What do you think about the CEO bonus debate?

Should any CEO's get a bonus?

- If yes, under what conditions?

- If no, how would you reward a CEO who brings the company out of difficult times into a profit margin?

6. As a 7th grade student, do you think you can do something to change this problematic situation in the United States? If yes, what kind of actions do you want to take?

Due to limited class time, the two questions were assigned as homework for the day.

Day Two

During the second day of the research, a table describing the relationship between educational attainment and income was presented to help students gain ideas between income and education levels prior to having discussions on the topic of Gender The graph was not directly connected with a social justice issue, but it would play an important role when students compared income data related to issues about Gender and social justice later.

To help students clearly understand each degree in Figure 7, the teacher explained terms, such as high school drop-out, high school graduate, bachelor, master, professional and doctorate. For example, a high school drop-out was explained as "if you started high school, but you don't finish." (Audio transcript, Monday, October 27, 2009). The teacher interpreted a bachelor's degree as the first degree attainable from four years of college. A doctorate was distinguished as separate from a degree from medical and judicial professions which belonged to professional degrees and students were often confused.
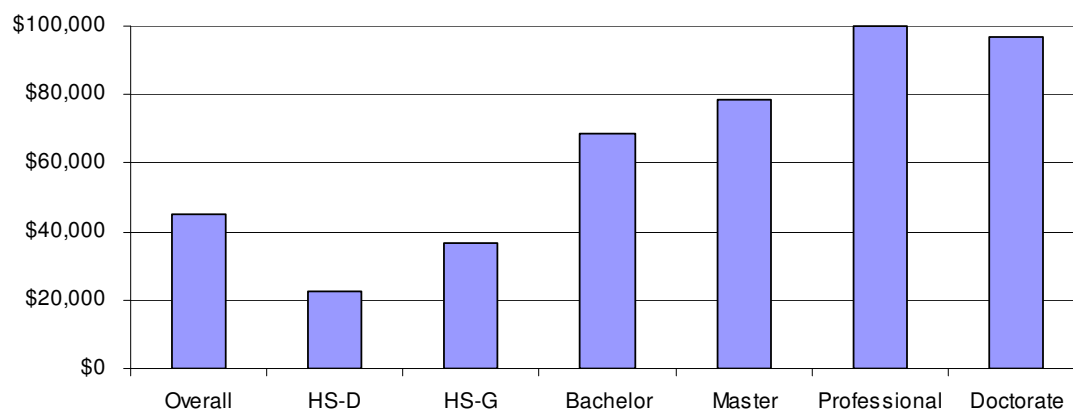
Figure 7. 2003 Median Income by Educational Attainment

Using the data above, students started the day's task by answering two mathematical problems and an extra question hereafter listed. As the cooperating teacher and I learned in the first day of lessons, thus, more than half of the students had a hard time dealing with numbers higher than 1,000. Thus, students were allowed to collaborate at each table.

1. The median income of the high school drop-out is what fraction of the median income of the doctorate?

2. _____ and _____ make less than the overall median.

3. What other comparisons can you make using this data?

Sharing their mathematical processes of problem solving, students briefly discussed what they thought about the graph in Figure 7. After the discussion, the teacher saved two

discussion questions followed by Figure 7 for homework, so they could get to the other topics under Gender and Income.

Using the graph in Figure 8, the teacher gave background information to students explaining that the graph compared incomes based on gender and educational attainment. In addition, she told the students they could determine how much money a person could expect to make when attaining a certain level of education based on whether they were male or female.
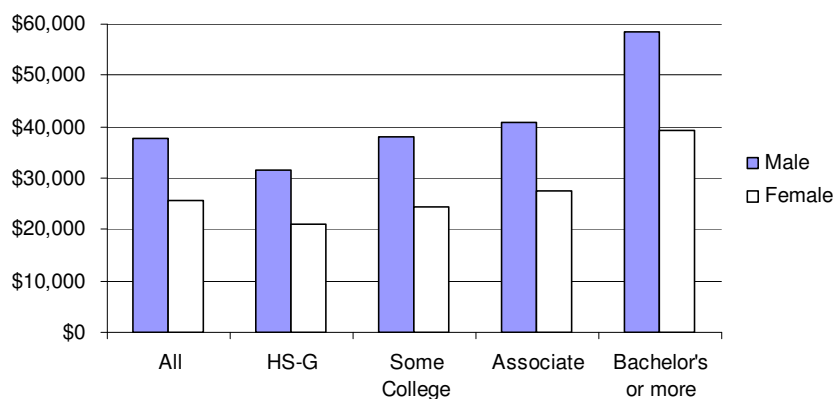

Figure 8. 2004 Median Income by Gender

A learning activity also started by performing two mathematical problems and an extra question related to the problems as follows.

1. The income of females with Associate's degrees is what fraction of the income of males with the same degree?

2. The income of females with Bachelor's degrees or higher is what fraction of the income of males with the same degrees?

3. What other comparisons can you make with this data?

After sharing how to solve mathematical problems, a discussion took place about the graph in Figure 8.

Then, the teacher used another table to show what income distribution looks like between full-time male and full-time female workers. The following table compares some regional data from the United States including District of Columbia, Idaho, Montana, New York, Utah and Wyoming. The data are median earnings, but not sorted by educational attainment at all.

Table 4-4.

2008 Median Earnings in the Past 12 Months of Full-Time, Year-Round Workers Aged 16 and Older by Gender and Women's Earnings as a Percentage of Men's Earnings by State

Area	Median earnings		Women's earnings as a percentage of men's earnings
	Men	Women	
United States	$45,556	$35,471	77.9%
District of Columbia	$57,393	$50,519	88.0%
Idaho	$41,461	$29,730	
Montana	$38,440	$29,634	77.1%
New York	$48,882	$40,490	82.8%
Utah	$45,028	$31,183	69.3%
Wyoming	$48,555	$31,204	64.3%

As usual, students began with doing mathematics with the data in Table 4-4. The mathematical problems are listed below.

1. Please fill in the blanks in the table.

2. How many areas are there where women's earnings as a percentage of men's earnings are higher than it in the United States?

3. How many areas are there where women's earnings as a percentage of men's earnings are lower than it in the United States?

4. How are women's earnings as a percentage of men's earnings in Idaho?

After taking some time to find the correct answers and various ways and procedures of problem solving, students shared what they discovered from the data.

Day Three

During the third day of the research, students continued working on issues in relation to Gender. The teacher explained Table 4-5 in detail, because the data might look busy to 7th grade students, and numbers in different units (number of people & median earnings) were coexisting. She told students the table was composed of data in our community such as Idaho, Ada County, Boise, Eagle, and Kuna. She also explained that the first major column in the table was all about males and the next was all about females. In addition, the teacher explained that each row was the number of workers or median earnings.

Table 4-5.

Earnings in 1999 of Full-Time, Year-Round Workers, by Gender in Our Community

Area	Male						Female					
	Workers with earnings	Median earnings in 1999	Earning in 1999				Workers with earnings	Median earnings in 1999	Earning in 1999			
			$1 to $24,999 or less	$25,000 to $49,999	$50,000 to $99,999	$100,000 or more			$1 to $24,999 or less	$25,000 to $49,999	$50,000 to $99,999	$100,000 or more
Idaho	232,696	$32,603	72,073	104,176	46,490	9,957	135,547	$22,939	75,192	49,664	9,432	1,259
Ada County	63,859	$37,867	15,493	27,171	16,937	4,258	40,760	$26,453	18,290	17,521	4,273	676
Boise	53,476	$37,349	13,161	22,999	13,837	3,479	34,742	$26,219	15,831	14,855	3,511	545
Eagle	4,789	$44,310	865	1,806	1,586	532	2,738	$29,538	1,605	1,154	412	107
Kuna	1,873	$36,744	514	899	414	46	1,066	$24,058	559	412	87	8

Using the data in Table 4-5, students did mathematical problems for four questions listed below:

1. What is the percentage of male workers making $100,000 or more compared to the total in Idaho?

2. What is the percentage of female workers making $100,000 or more compared to the total in Idaho? Compare the result with the answer in Question 1.

3. What is the percentage of male workers making less than $50,000 compared to the total in Boise?

4. What is the percentage of female workers making less than $50,000 compared to the total in Boise? Compare the result with the answer in Question 3.

Before discussing what they noticed and felt about the data, students and the teacher collaborated to find correct answers and mathematical problem solving processes.

However, it was found that most students had a hard time understanding what the numbers in the table meant. Thus, the teacher explained and showed processes toward correct answers. Then students responded to discussion questions listed below.

1. Why is there a discrepancy of income level between males and females with the same educational attainment in Table 1?

2. (Females respond to these questions) How does this information make you feel? What solutions would you propose for addressing this discrepancy?

3. (Males only respond to these questions) How does this information make you feel? Should this discrepancy be protected? Why or why not? What solutions would you propose for addressing this discrepancy?

4. As a 7th grade student, what do you think you can do to change this discrepancy? In what ways?

As the discussion unfolded over time, students started to share what they noticed from data throughout the lessons on Gender and Income and what the underlying meanings on them.

Day Four

During the last day of the research, the class started with the graph in Figure 9, the 2007 Mean Household Income of Householder by Ethnicity. Because students had a hard time dealing with the busy data a day ago, the teacher encouraged students to work together at their table in order to hold their interest in the lesson.
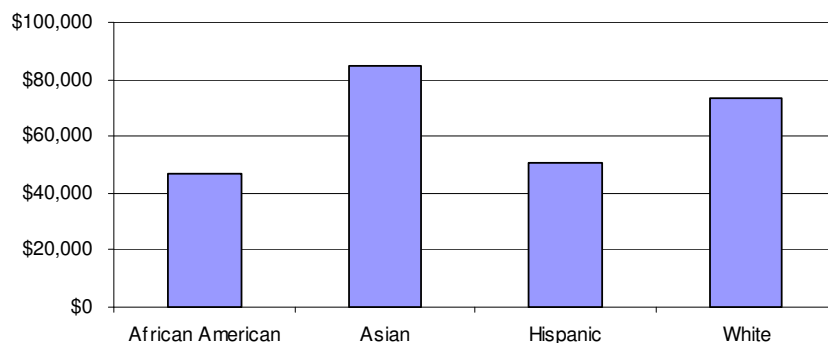
Figure 9. 2007 Mean Household Income of Householder by Ethnicity

Students collaborated in their teams to answer three mathematical problems using Figure 9. Problems are below.

1. The mean income of African Americans is what fraction of the mean income of Asians?

2. The mean income of Hispanics is what fraction of the mean income of whites?

3. The mean income of Asians is about _____ times the mean income of Hispanics.

As students were finishing up the mathematics problems, they shared answers and their process toward finding answers with the teacher. The teacher started to facilitate discussion using the following question, "How many of you were surprised at this data? What surprised you in this data?" (Audio transcript, Thursday, October 29, 2009).

After the discussion, the teacher introduced one more related regional data set with Ethnicity, the 2005 Pacific Northwest Median Household Income by Ethnicity.

Briefly reading the data in Figure 10, she explained to students that this data included our community, Idaho and Ada County, however, the statistics on Hispanic household's income in Ada County was not available for some reason.
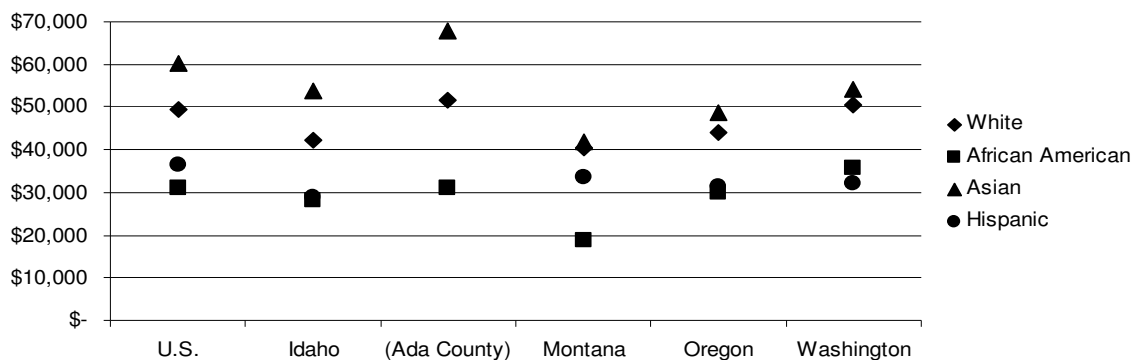

Figure 10. 2005 Pacific Northwest Median Household Income by Ethnicity

Looking at the graph, students were asked to answer two mathematical problems below by working together with people at their table.

1. In the United States, the median household income for white households is $49,453 but only _____ for black households - a difference of nearly _____.

2. In the State of Idaho, the median household income for Asian households is _____ but only _____ for Hispanic households - a difference of nearly _____.

After sharing the process toward correct answers on the two questions, the teacher had students write their reflections to four discussion questions.

1. What thoughts do you have about this information on income levels by ethnicity?

2. Why do you think there are differences of income levels between ethnic groups?

3. Thinking about the ethnicity of your parents, what are your thoughts about ethnic groups that make more income and ethnic groups that make less income?

4. As a 7th grade student, do you think you can change this discrepancy? If yes, in what ways?

Students discussed their findings and thoughts from the graph. Followed by a short discussion about Figure 10 due to limited class time, the teacher read through the final reflection questions to help students clearly understand what each question meant before the final lesson ended.

1. Write down three facts about the income information that you learned from the tables and figures.

2. When your teacher had you discuss issues related to income levels, what understanding or awareness did you gain about different income levels and possible causes in U.S. households?

3. Can you explain how your thinking or awareness of income issues might have changed or stayed the same?

4. What did you hear from your classmates that surprised you or made you think about your own understanding of inequality? Were there statements that made you angry? Please explain your answers to these questions.

5. Do you think it is important for our society to work on the problem of income inequity? Why or why not?

6. What do you think you could do in the future to solve problems of income inequity? Please explain your answer.

7. How much do you like mathematics? Please indicate a number of degrees ranging from 1 to 10. Ten means you like mathematics very much.

    - Could you explain why you like mathematics that much?

8. What did you think of mathematics when you interpreted the data in the tables and figures? Did you learn something new about our society?

    - Was mathematics more interesting than before? Did you feel the same before and after? Were you bored? Could you explain why you responded in that way?

After four days of social justice lessons were finalized, the teacher announced to students that their reflective writing would need to be turned in by the following Monday.