

THE INFLUENCE OF DIVERSITY EXPERIENCES
ON COLLEGE STUDENT OUTCOMES:
AN INSTITUTIONAL STUDY

by

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of the requirements for the degree

of

Doctor of Education

in

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DEDICATION

This dissertation is dedicated to my grandmother, Mrs. Frank Brown.

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ABSTRACT

The problem addressed in this study is that higher education institutions need to know how different groups of undergraduate students experience diversity differently and how these experiences may differentially influence desirable college student outcomes. A quantitative analysis design using secondary survey data from the National Survey of Student Engagement was employed to answer the research questions in the investigation. Ordinary least squares (OLS) regression was used to model the relationship of the dependent variable(s) (student outcomes) on a collection of independent variables (diversity experiences, student demographics). Accordingly, OLS provided estimates of the association between student experiences with diversity and self-reported student outcomes. Findings revealed that each diversity experience (coursework, interactional and climate for diversity) had a positive influence on the student outcomes of educational gains, personal and social gains, institutional satisfaction and supportive campus environment. The diversity experience by gender or by race and ethnicity interactions were not consistent across student outcomes. Importantly, findings also revealed that coursework diversity may not be as influential predictor of student outcomes when other forms of diversity experiences are available to students. This study offers additional support that indeed diversity experiences are important to the educational mission in higher education.

CHAPTER 1

INTRODUCTION TO THE STUDY

Introduction

The presence of an increasingly diverse student body at higher education institutions today is apparent. Women have transformed the college campus by becoming the majority of all undergraduates and receiving the greater part of degrees awarded from college institutions statewide (Peter & Horn, 2005). The number of men attending college has also increased by 18% in the last decade (National Center for Educational Statistics, NCES, 2008). Increases in the number of African Americans, Hispanics, Asians, Pacific Islanders and Native/Alaskan Americans attending college has also been observed (NCES, 2008) as well the number of multiracial (Shang, 2008), non-traditional (25-40 yrs of age) and part-time students (NCES, 2008). These trends are projected to continue well into the next decade (NCES, 2008).

At higher education institutions, a diverse student body is thought to create opportunities for students to develop their skills in order to help them relate to and prepare for work in a larger more diverse society (Gurin, 1999; Pike & Kuh, 2006; Pascarella, Edison, Nora, Hagedorn & Terenzini, 1996). Institutional efforts that are focused on diversity are thought to enhance the quality of the undergraduate experience (Kuh, Kinzie, Shuh & Whitt, 2005). And, as a result of experiencing diversity according to Umbach and Kuh, (2006),

...students learn how to work effectively with others and how to participate actively and contribute to a democratic society. Moreover, through engaging with people from different backgrounds and with different life experiences, students are adding to the foundation of skills and dispositions that is essential for living a productive, satisfying life after college in an increasingly multicultural world. Thus, the very act of experiencing diversity during college helps students develop the habits of the mind and heart that enlarge their capacity for doing so after college (pg. 170).

Many colleges today have placed a priority on developing and enhancing their diversity experiences with the understanding that these experiences are important for college student development. How an institution may define diversity or its experiences is complex because many activities, policies, approaches, and contexts may define diversity. For example, diversity may constitute minority representation of the student body, or the perception of having a diverse student body on campus or the number of times a student interacts with people from different religions, ideas, perspectives, and worldviews (Gurin, 1999; Kuh, 2001; Umbach & Kuh, 2006). At some institutions, diversity experiences may constitute taking a foreign language or multicultural class (Gurin, 1999; Kuh, 2001; Umbach & Kuh, 2006). Diversity may also represent having affirmative action plans on campus, having a number of ethnically or racially diverse professors on campus or having programs that aim to achieve minority representation of students in certain disciplines (Antonio & Muniz, 2007 and references therein; Kuh et al., 2005). These different meanings present enormous challenges for institutions today.

In the last decade, a significant amount of interest has been directed toward the educational benefits of diversity. Research has provided credible evidence that student engagement in diversity experiences not only enriches student's academic and social development, but also affects their overall impact of college (Chang, 1999; Gurin, 1999;

Pascarella, 2006; Pascarella & Terenzini, 2005 and references therein; Umbach & Kuh, 2006). Investigations have revealed that experiences with structural diversity (the demographic composition of the student body), interactional diversity (student opportunities of cross-group interactions in and out of the classroom) and diversity in coursework (the degree which diversity appears in the curriculum) have contributed positively to student's satisfaction with college, openness to diversity, feelings of a supportive campus, cognitive development, self confidence, a sense of belonging, and engagement in citizenship (Chang, 1999; Chang, 2001; Hu & Kuh, 2003; Hurtado & Ponjuan, 2005; Gurin, 1999; Pascarella et al., 1996; Umbach & Kuh, 2006; Villalpando, 2002; Whitt, Edison, Pascarella, Nora & Terenzini, 1999; Zuniga, Williams & Berger, 2005). In addition, students who perceive that their institutions encourage and value interactions with people from different backgrounds (also referred to as climate for diversity) have also been linked to gains in personal and social development and to feelings of a supportive campus environment (Kuh & Umbach, 2005). Despite small effect sizes reported in some of these investigations, Chang (1999) believes that even small statistical significances offers some promise about diversity's affect on student outcomes and its value in improving institutional programs and policies. Further, the cumulative effects of multiple diversity experiences outpace those for any single diversity experience.

Much of the literature reviewed about the impact of diversity experiences on various student outcomes has implied that these experiences have the same general effect for all college students. Many of these studies have used large national data sets to link

the importance of student engagement activities with diversity and desirable student outcomes. As important as these studies are and continue to be for future inquiry, few studies have documented how different groups of students, (students different in racial and ethnic backgrounds, social and economic backgrounds, gender, year in school, and age for example), engage in diversity experiences and how these experiences may impact desirable student outcomes. Accordingly, few studies have reported how students may differentially experience diversity.

The institutional assumption that all students experience diversity positively may be too limited as well. Bloom, (1987) and D'Souza (1991) (as cited in Pike & Kuh, 2006) found in their investigations that interaction among diverse groups of students lead students to believe that their college was less hospitable and affirming. Accordingly, institutions that focused on achieving structural diversity encountered conflict and tension among different groups of students on campus (Hurtado, Milem, Clayton-Pederson & Allen, 1998). And at colleges that lack diverse student populations, minority groups may be viewed as tokens (Milem, Chang, & Antonio, 2005) which can negatively affect student achievement and college success (Smedley, Myers, & Harrell, 1993).

Limiting investigations to only explore the general effects of student engagement in diversity experiences and its impact on student outcomes may mislead and mask dramatic differences for different groups of students on campus (Pascarella, 2006). Thus, exploring how different college groups respond to diversity experiences and its differential impact on college student outcomes provides a logical next step in understanding a complex issue. Justification for this type of investigation is obvious:

understanding the experiences of college through a cultural and social lens may better help to understand the different student cultures on campus and its role in a student's personal, social, and academic growth (Pascarella, Pierson, Wolniak & Terenzini, 2004).

Institutions that aim to meet the needs of a changing student body may need to refocus their efforts to examine experiences that include traits and characteristics specific to diverse groups of students (Pascarella, 2006). Accordingly, because institutions are thought to be microcosms of society; a place where different groups of students can experience positive and negative effects from the same thing, it is important to reveal how institutions expose their students to different forms of diversity (Gurin, Dey, Hurtado & Gurin, 2002). Insight into this line of inquiry may help institutions to better focus beyond the narrow lens that all students experience diversity similarly, and may help to create and implement diversity initiatives that are inclusive and representative of a changing student body.

A charge then to the higher education sector is to extend and expand the notion of diversity and to be inclusive of populations previously ignored in the literature. This will be a positive step in understanding the changing student landscape according to Pascarella (2006). And as mentioned previously, even though current literature directly links student engagement in diversity experiences to desirable student outcomes for the general population (Denson & Chang, 2009; Pascarella & Terenzini, 2005; Umbach & Kuh, 2006), the wide disparities in socioeconomic status, race, and ethnicity still observed in college entrance, access and graduation patterns (Freeman & Fox, 2005; Gladieux & Swail, 2002), highlights the need to explore as many diversity contexts as

possible to improve upon student's success in college. Institutions may find that identifying conditional effects of diversity experiences and its differing impact on college student outcomes could have broad implications for addressing such issues as retention, persistence and graduation rates for all types of college students.

Statement of the Problem

Student engagement research provides institutional and societal stakeholders with rich information on college student development and college student outcomes (Pascarella & Terenzini, 2005). Student's engagement with diversity experiences has indeed informed the higher education sector and a number of investigations have already emphasized the positive impact of a diverse student body on educational benefits.

Although diversity literature has informed the audience of the positive impact of diversity experiences on a student's personal, social and academic development for the general population, less clear are the conditional effects from such experiences and its differential impact on desirable student outcomes. The problem addressed in this study is that higher education institutions need to know how different groups of undergraduate students experience diversity differently and how these experiences may differentially influence desirable college student outcomes. Information gleaned from this investigation will help to extend knowledge in higher education on diversity issues and its impact on college student outcomes and may help to inform institutional stakeholders about the quality of educational experiences, institutional effectiveness, retention, and social justice issues.

Purpose of the Study

The purpose of this secondary data analysis was to understand the impact of student engagement in diversity experiences on student's self-reported college outcomes among different groups of undergraduate students at Montana State University. The different student groups in this investigation were identified by (1) gender and (2) race and ethnicity. Survey data from the National Survey of Student Engagement collected in 2007 and 2008 at MSU were the data sets used to inform this investigation.

Conceptual Framework

Bronfenbrenner's Ecology Model provides the conceptual framework for this investigation (Bronfenbrenner, 1979). Bronfenbrenner's ecology model holds that an individual's development is influenced by multiple environments identified as the microsystem, mesosystem, exosystem, and macrosystem (Bronfenbrenner's, 1979). The four systems are nested together to create an individual's ecology (Figure 1). The individual is placed at the center of the microsystem and distal environments uniquely influence and contribute to a developing individual but equal importance is also given to the interconnectedness or the relationships of the environmental layers to an individual's development. Bronfenbrenner's model attempts to account for the developing individual as a dynamic and active entity where interactions between the person and environments are a two-way street (Bronfenbrenner, 1979). Specifically, in order for development to occur, an individual must be involved in multiple and complex tasks.

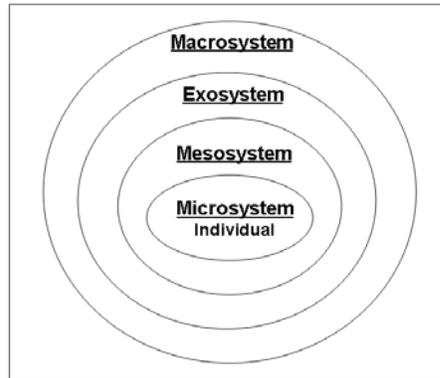


Figure 1. Bronfenbrenner's Ecology Model

A microsystem is defined as “a pattern of activities, roles, and interpersonal relations experienced by the developing person in a given setting with particular physical and material characteristics’ (p. 22, Bronfenbrenner, 1979). The microsystem is where most direct interactions with family, peers, friends, and teachers take place. The mesosystem “comprises the interrelations among two or more settings in which the developing person actively participates...Mesosystems form whenever the developing individual moves into a new setting” (p. 25, Bronfenbrenner, 1979). Two or more microsystems are considered a mesosystem. The exosystem as defined by Bronfenbrenner (1979) is “one or more settings that do not involve the developing person as an active participant, but in which events occur that affect, or are affected by what happens in the setting containing the developing person (p. 25). The macrosystem refers to “consistencies, in the form and content of lower-order systems (micro-, meso-, and exo-) that exist, or could exist at the level of subculture or culture as a whole, along with any belief system or ideology underlying such consistencies” (p. 26). The macrosystem is dependent on time, place and culture.

Although Bronfenbrenner's model was originally constructed from his work in early childhood development, his ecology model can be readily used to help understand college student development (Renn, 2003). The institutional setting provides multiple environments that students interact in and are influenced by.

In the context of a higher education setting, a microsystem is a face-to-face setting in which the individual is present. Microsystems for college students may include college classrooms, laboratories, athletic teams, friendship groups, jobs, dormitories, and families (Figure 2). Mesosystems are the interactions of two or more microsystems and represent the relations with peers and friendship groups, and or the relations of family experiences with college experiences (Figure 2). According to Renn (2003), "college students are embedded in interacting mesosystems of academic, social, family, and work life and the mesosystems provide a variety of forces and resources that affect identity development" (pg. 389). Renn (2003) provides an example of a mesosystem as a student who may receive messages about what it really means to be "really latino" from one microsystem of friends but may be supported or even challenged from a different microsystem, a professor, who teaches the cultures of Latin America.

Exosystems refers to settings that do not contain the student but have some influential effect on the developing student. Federal aid policy is an example of an exosystem's influence on a student (Renn, 2003). Students may need to work to earn additional money to pay for college despite receiving some financial aid. And lastly, the macrosystem is defined by historical trends and events, cultural expectations, and social

forces (Renn, 2003). Cultural understanding of race, gender and ethnicity are representative of a macrosystem (Renn & Arnold, 2003).

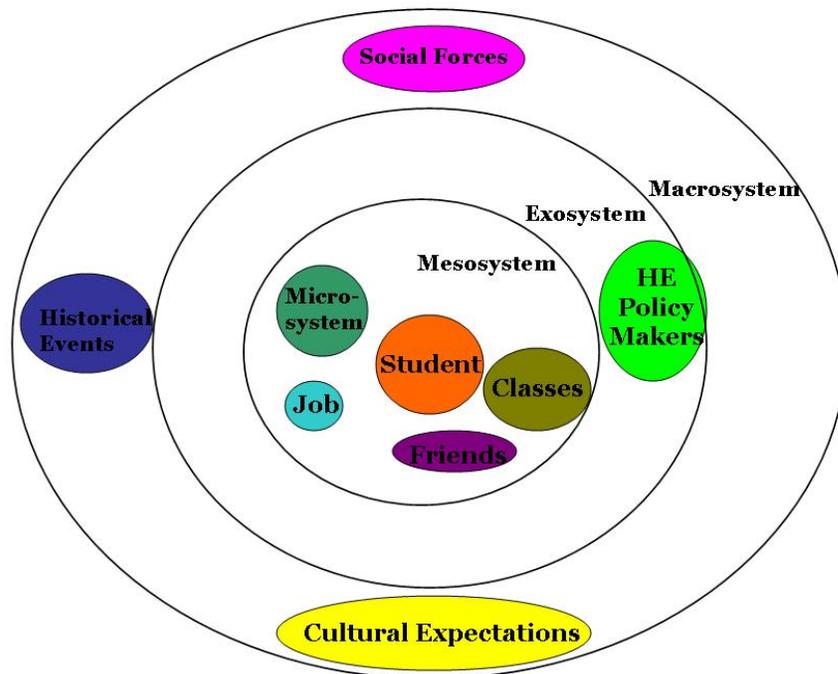


Figure 2. Applying the Ecology Model to a Campus Environment (Renn, 2003)

In this investigation, the researcher explored how different groups of undergraduate students, experience diversity differently and how these experiences may differentially influence desirable college student outcomes. Because the ecology model provides a way to explore different environments on students development, the researcher suggests that the three diversity experiences utilized in this investigation: coursework in diversity (including diverse perspectives in class discussion or writing assignments), interactional diversity (student exchanges with diverse people and exposure to diverse ideas, information and experiences) and climate for diversity (institution encourages

contact among students from different economic, social, and racial or ethnic backgrounds) represent different environmental levels identified in Bronfenbrenner's model. The researcher identifies interactional diversity as a microsystem of a student. Coursework in diversity is identified by the researcher as a mesosystem and climate for diversity is identified by the researcher as a macrosystem of a student. Student experiences of diversity at the micro and meso levels are thought to be more influential on college student outcomes than macrosystems where face-to-face interactions in and out of the classroom, peer and friendship groups, and faculty interactions are known to significantly influence learning (Kuh, 2001; Pascarella & Terenzini, 2005; Renn, 2003; Umbach & Kuh, 2006).

Using the ecology model in this context provides a means to assess diversity experiences and student development using multiple student environments. This focus allowed the researcher to explore about how diversity experiences defined by the micro, meso and macro levels may shape student outcomes. Understanding which diversity experience(s) may promote more powerful student learning and development and to which students will offer meaningful information to the institution about the student, the campus environment, the curricula, and student satisfaction with college.

Student's Engagement in Diversity Experiences and Student Outcomes

Engagement is a term identified in the literature for many years with its meaning evolving over time (Kuh, 2009 and references therein). According to Kuh (2009), student engagement represents constructs like the quality, effort and involvement in

educational purposeful activities. Kuh, (2009) further adds, “in the absence of actual measures of student learning, student engagement data are process indicators or proxies for learning outcomes” (pg. 9).

The creation of and widespread use of the National Survey of Student Engagement (NSSE) has helped to demonstrate that student engagement can be measured at different higher education institutions and its data used to improve upon college student experiences. This investigation uses data collected from a sample of undergraduates at Montana State University (MSU) who completed the NSSE. Data on student’s engagement in diversity experiences and data from self-reported student outcomes as defined in NSSE are the variables identified in this study. Although Chapter 2 will review the literature on student engagement and the NSSE instrument, to help understand the variables used in this investigation, the following section defines what student’s engagement in diversity experiences means and identifies which student outcomes were measured in this investigation.

NSSE has identified five benchmarks based on forty-two questions that capture important aspects of student experiences. One of the benchmarks “enriching education experiences” further identifies questions relevant to different types of student’s engagement in diversity experiences. For the purpose of this investigation and used as a set of independent variables, the following diversity experiences are defined.

Diversity in Coursework

Diversity in coursework was operationally defined as institutional efforts through purposeful activities (cultural awareness workshops, and coursework, ethnicity electives,

required diversity courses) to help students engage in diversity experiences (Umbach & Kuh, 2006). The NSSE question addressing diversity in coursework is the following:

About how often have you done the following?

- Included diverse perspectives (different races, religions, genders, political beliefs, etc) in class discussion or writing assignments.

Interactional Diversity

Interactional diversity was operationally defined as student exchanges with diverse people as well as student's exposure to diverse ideas, information and experiences during the course of their college life (Umbach & Kuh, 2006). The NSSE questions addressing interactional diversity are the following: About how often have you done the following?

- Had serious conversations with students of a different race or ethnicity than your own.
- Had serious conversations with students who are very different in terms of their religious beliefs, political opinions, or personal values. (Cruce & Laird, 2009)

Climate for Diversity

Accordingly to Kuh and Umbach (2005), climate for diversity represents a student's perception that their institution encourages and values interaction with people from different backgrounds. The NSSE question addressing climate for diversity is the following: To what extent does your institution emphasize the following?

- Encourage contact among students from different economic, social, and racial or ethnic backgrounds.

Diversity experiences in college have been positively associated with a host of other educational experiences and student outcomes (Kuh & Umbach, 2005). The NSSE asks a number of questions about students' perceptions of their college environment that are associated with student outcomes in achievement, satisfaction and persistence (Kuh, 2009). Student outcomes, as measured by student's self-reported responses to sets of questions on the NSSE, were the dependent variables used in this investigation and are defined in the following section.

College Student Outcomes

College student outcomes are theoretically defined as indicators of educational practices that influence attitudes, values, achievement, and student development (Kuh, 2001). As mentioned previously, a number of investigations have illustrated the relationship between different types of student engagement in diversity and student gains in educational, personal and social development (Kuh, 2001).

The NSSE asks sets of questions that are associated with features of the college environment that deal with achievement, satisfaction with college, and persistence (Kuh, 2009). Additional categories of questions have students estimating their educational and personal development since beginning college. Having this kind of information on the NSSE allows researchers to better understand how student engagement experiences influences college student outcomes. With this information, student's self reported measures of (1) institutional satisfaction, (2) supportive campus environment, (3) gains in

education and (4) gains in personal and social development will be the four student outcomes measured in this investigation (Table 1). The researcher selected the student outcomes based on the literature and areas that corresponded to objectives and goals common to students in college.

Student Groups

The NSSE also asks students to provide information about their age, year in school, race/ethnicity, gender and general background questions (i.e. major, grades, living arrangements, and parents education). This information allows researchers to better understand the relationship of engagements activities and students outcomes for different groups of students (Kuh, 2009). Table 1.1 identifies the student groups that informed this investigation.

Research Questions

The primary research question addressed in this study was:

1. What are the relationships between student's engagement in diversity experiences and student's self-reported college outcomes?

The interaction research questions addressed in this investigation follow:

2. To what extent do the relationships between diversity experiences and self-reported college student outcomes vary between females and males?

3. To what extent do the relationships between diversity experiences and self-reported college student outcomes vary between different races and ethnicities?

Table 1.1 Variables Associated with this Investigation

Student Groups	Self-Reported Student Outcomes	Diversity Measures
Gender	Institutional Satisfaction	Diversity in Coursework
Race/Ethnicity	Supportive Campus Environment	Interactional Diversity
	Gains in Educational Development	Climate for Diversity
	Gains in Personal and Social Development	

A quantitative research approach analyzing the responses of undergraduate Montana State University students who completed the National Survey of Student Engagement helped to answer the stated research questions above.

Research Hypotheses

The following research hypotheses were generated based on Bronfenbrenner’s ecology model of student development. Literature has revealed that all three diversity measures have positive affects on several student outcomes. However, students who experience diversity at the micro and meso levels where more personal and face-to-face

interactions take place may have more positive affects on student outcomes than those students who experience diversity at the macro level where ideas of diversity from an institutional perspective may not be as influential. With this information, the following main research hypotheses are presented.

1. Undergraduate students at Montana State University who more often engage in diversity experiences at the micro, meso and macro levels will report higher gains in college student outcomes than students who participate less often.
2. Undergraduate students at Montana State University who more often experience diversity at the macro level will report lower gains in college student outcomes than students who more often engage in diversity at the micro and meso levels.

The interaction hypotheses presented are as follow.

3. Female students at Montana State University who often engage in diversity experiences at the micro, meso and macro levels will report higher gains in college student outcomes compared to their similarly-engaged male counterparts.
4. Students at Montana State University who are from traditionally under-represented groups on campus and who often engage in diversity experiences at the micro, meso and macro levels will report higher gains in college student outcomes compared to their similarly-engaged counterparts from traditionally represented groups.

Definition of Terms

For the purpose of this study, the following terms were operationally defined.

1. *Student Engagement*: Student engagement in this investigation was defined as a student's participation and behavior in educational purposeful activities as determined by the National Survey of Student Engagement.
2. *First Year Students*: First year students in this investigation was defined as those students who were admitted the summer or fall of the academic year in which they took the NSSE survey First year students may have credits accepted from Montana State University due to AP, IB, dual enrollment, and or some college credit (< 30) but ultimately their enrollment at the institution was their first real college enrollment.
3. *Senior Year Students*: Senior year students in this investigation were those students who have 90 to 120 credits as of the fall of the academic year in which they took the NSSE survey. Senior year students may be students who started at Montana State University as a freshman or may have transferred to the University from another institution.
4. *National Survey of Student Engagement (NSSE)*: NSSE is an annual survey administered to samples of first year and senior students about the quality of their college experience as an undergraduate. A more detailed discussion of the NSSE appears in Appendix A.

5. *Diversity Experiences*: For the purpose of this investigation, diversity experiences were those in and out of classroom experiences that feature race, ethnicity, multiculturalism, and social justice perspectives (Kuh et al.2005). Using the NSSE, diversity experiences were defined as a student's perceptions of climate for diversity, interactional diversity and coursework in diversity.
6. *Structural Diversity*: Structural diversity was operationally defined as the student body composition of the institution (Umbach & Kuh, 2006).

Significance of the Study

Results of this study offer important contributions to existing literature on the impact of diversity experiences on student outcomes for different groups of undergraduate students at Montana State University. Findings from this study may be used to improve student experiences on campus, offer insight into what different types of students gain from their college experiences and how diversity perspectives may shape college outcomes and student's overall college experience. Finally, findings from this investigation may not only augment and provide insight into the theory and practice of existing campus initiatives and programs at MSU but also contribute to new lines of inquiry and practices that support college student success.

Limitations and Delimitations of the Study

The following limitations and delimitations were part of this study.

1. The quantitative data analyzed were from MSU-cohorts who participated in the 2007 and 2008 NSSE; therefore results can only be generalized for students at MSU.
2. NSSE is a self-reported web-based survey. It is assumed that students responded honestly to the questions being asked.
3. It is unclear as to whether students who did not want to participate in this investigation responded similarly to the students who participated in the investigation.
4. Students enter college with characteristics that may influence diversity experiences in college. Not all controls for pre-college characteristics were employed in this investigation.
5. NSSE is a short survey that addresses certain diversity issues and student development outcomes, therefore different results could emerge if additional questions were included in these categories on the survey.
6. There are several different measures of diversity experiences and college student outcomes that are available than just the variables or the instrument used in this investigation.

Chapter Summary

In this chapter, the background information, problem purpose and significance of the investigation were presented. Research questions were also identified along with the limitations of the study. A review of relevant literature and a detailed description of the

methodology specific to this investigation are presented in Chapters 2 and 3 respectively. Chapter 4 describes the results of the investigation and Chapter 5 discusses the conclusions of this study and presents recommendations for further research.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Introduction

The review of literature is organized into the following areas with each area contributing to understanding the research problem presented in this investigation: (1) Student Engagement; (2) The Diversity Rationale and Higher Education; (3) College Student Outcomes; and (4) Linking Diversity with Student Outcomes.

Student Engagement

College student development research has revealed that the time and energy students devote to “educational purposeful activities” is the single best predictor of their learning and development (Astin, 1984; Kuh, 2004; Kuh et al., 2005 and references therein). Institutions that emphasize good educational practices, enables administrators, faculty, staff and students to focus on learning activities that promote higher levels of engagement. With higher levels of student engagement, yields on desirable college student outcomes increases (Astin, 1984; Kuh et al., 2005; Kuh, 2003; Pace, 1984; Pascarella & Terenzini, 2005).

Student engagement is considered the most important factor in student learning and development (Hu & Kuh, 2002). Student engagement according to Kuh et al. (2005) is a joint effort between the institution and student. Students must actively take part in campus life and institutions must allocate and provide resources and services that induce

students to participate and actively engage (Kuh et al., 2005). While the student engagement construct is significantly influenced by many areas, Astin's (1984) involvement theory "fleshed out" the importance of student involvement with respect to student development and achievement (Kuh, 2009). In his investigation, Astin's (1984) found students were more likely to remain in college if they were involved in certain types of collegiate activities, students who were not involved in activities, left college early. Astin (1984) defined student involvement as the "amount of physical and psychological energy that the student devotes to the academic experience" (p. 297) and further explained that a student who is highly involved in the college experience is one who is devoted to studying, one who participates actively in student organizations, who spends time on campus and who interacts with faculty and friends frequently.

Conversely, a student who lacks involvement in the college experience is likely to neglect studying, refrains from spending time on campus, and has infrequent contact with faculty and peers on campus. Astin (1984) based his theory on the following five postulates:

1. Involvement refers to the investment of physical and psychological energy in various objects. The objects maybe highly generalized (the student experience) or highly specific (preparing for a chemistry exam).
2. Regardless of its object, involvement occurs along a continuum; that is, different students manifest different degrees of involvement in a given object, and the same student manifests different degrees of involvement in different objects at different times.

3. Involvement has both quantitative and qualitative features. The extent of a student's involvement in academic work, for instance, can be measured quantitatively (how many hours the students spend studying) and qualitatively (whether the student reviews and comprehends reading assignments or simply stares at the textbook and daydreams).
4. The amount of student learning and personal development associated with any educational program is directly proportional to the quality and quantity of student involvement in that program.
5. The effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement (p. 298).

Astin (1984) further noted that the quality and quantity to which students are involved, influences the degree to which positive student outcomes are experienced. In Astin's (1984) study, involvement was shown to influence cognitive learning, satisfaction with college, and increased rates of student retention. Research in the past decade has revealed that different forms of student involvement can lead to different developmental outcomes and that certain institutional practices can also lead to higher levels of student engagement (Pascarella & Terenzini, 2005).

For educators, Astin's (1984) theory provided a framework for making policies and programs, and curricula and classroom environments ideal for students to become more involved in the college experience. For researchers, Astin's theory provided a backbone that helped expand the different contexts of student engagement and its link with student development and gains in college student outcomes. The need for such

research to continue is important. In the past decade alone, student engagement research has provided the higher education sector with important information about student development and success (Kuh, 2009; Pascarella & Terenzini, 2005). While no single blueprint for student success exists, monitoring the change and development of students by assessing student engagement information and understanding its relationship to student outcomes is just one important avenue of exploration.

Diversity experiences as a form of student engagement and its impact on student outcomes in higher education has been a field of significant interest as the research helps to uncover how diversity plays a role in a student development. As mentioned previously, diversity at an institution may be defined and contextualized in a number of different ways. Structural diversity, according to Hurtado et al. (2003) primarily refers to the racial and ethnic composition of the student body. Increasing the structural diversity of a student body is essential in creating a diverse learning environment. A diverse student body is also thought to provide opportunities for students to interact with someone from a different race, ethnicity, religious or political background. This type of diversity experience is identified in the literature as interactional diversity (Umbach & Kuh, 2006) and is observed not only as student exchanges with diverse people but also as student's exposure to diverse ideas, information and experiences during the course of their college life (Umbach & Kuh, 2006). According to Antonio and Muniz (2007), the most direct effects of diversity are realized through student interactions. Research in this area and its relationship to a number of student outcomes continues to be informative. The results offer much empirical information and illustrate the positive effects of

interactional diversity on a student's personal, social, and academic development (Bowman, 2010; Gurin et al. 2002; Hurtado, 2007; Pascarella et al., 1996; Umbach & Kuh, 2006). Finally, Chang (2001) identified that changes in structural diversity can also create situations that increase the number and the nature of diversity-related initiatives (also known in the literature as coursework or classroom diversity) on campus. The initiatives may take form in the number of multicultural or diversity events on campus, workshops on cultural or diversity awareness, and or racial and ethnic courses offered by institutions (Umbach & Kuh, 2006). According to Bowman (2010), full length courses on diversity (i.e. women's studies or ethnic course studies) should provide a deeper exploration of diversity issues than for example a workshop on diversity. However, both types of diversity have been shown to have positive effects on a number of student outcomes (Denson & Chang, 2009; Gurin et al. 2002; Hurtado, 2003; Pascarella & Terenzini, 2005; Umbach & Kuh, 2006). The impact of each of these types of diversity experiences will be discussed in greater detail later in the chapter.

Because attention given to affirmative action programs and the desire for higher education institutions to prepare students to live and function in a pluralistic and diverse society (Hurtado, 2007), this line of inquiry provides meaningful information about the rationale for diversity in higher education. The next section discusses what is meant by the diversity rationale in higher education.

The Diversity Rationale and Higher Education

The United States Supreme Court in 1978 expectantly shaped the context and meaning of diversity in higher education with its highly publicized decision in the *Bakke v. University of California Regents* case. In this case, the Supreme Court (for the most part) outlawed inflexible quota systems in affirmative action programs. However, the High Court affirmed that race could be used as one of the factors in considering a diverse student population in certain admissions programs at higher education institutions (<http://laws.findlaw.com/us/438/265.html>). The subsequent cases of *Hopwood v. University of Texas* (1992) and two University of Michigan cases, *Gratz v. Bollinger* (2002) and *Grutter v. Bollinger* (2002) have not only tested the 1978 Supreme Court ruling, these cases have confirmed the pursuit of the diversity rationale as an ongoing interest in higher education today. The diversity rationale is the “whether and how” diversity, in its many forms and contexts, affects higher education (Gurin et al. 2002; Hurtado, 2007).

Proponents of diversity would argue that creating diversity experiences in college prepares students to work and live in a society where obvious religious, racial and economic differences exists (Hurtado, 2007). Gurin’s et al. (2002) investigation demonstrated that students with the most diversity experiences during college had the most diverse friends, neighbors, and work associates five years post college. The immediate benefits of experiencing diversity in college have been described as follows:

Education plays a foundational role in a democracy by equipping students for meaningful participation, and students educated in diverse settings are more motivated and better able to participate in our increasingly heterogeneous,

complex and multicultural democracy: They are better able to appreciate the ideas of others -- called "perspective taking" -- when they interact with diverse peers on an equal footing. They are more equipped to understand and consider multiple perspectives, deal with the conflicts that different perspectives sometimes create, and appreciate the common values and integrative forces that harness differences in pursuit of the common good. Encountering students from different racial and ethnic groups on campus enables students to get to know one another and to appreciate both similarities and differences (¶ 6, NA, *The Compelling Need for Diversity in Higher Education; Gratz, et al. v. Bollinger, et al.* No. 97-75231).

Conversely, critics and opponents of diversity would argue that diversity, especially achieving a racial and ethnically diverse campus, has no educational benefits, polarizes campuses, helps lower academic standards of the institution, denies opportunities for more qualified candidates, creates differential and unfair admissions policies and can even be harmful to students (Chang, 2001; Rothman Lipset & Nevitte, 2002).

The need for ongoing research to continue the discourse on the diversity rationale in higher education is compelling for reasons mentioned above. The conceptual link between different forms of diversity on campus and its potential influence on educational outcomes is the line of research influencing this investigation. The next section is focused on identifying student outcomes affected by diversity experiences followed by a review of the literature linking diversity experiences to gains in student outcomes.

Student Outcomes

Research has shown that diversity on college campuses benefits students, institutions, and society (Milem & Umbach, 2003). Student benefits refer to the outcomes and experiences that are enhanced from diversity experiences. Institutional

benefits refer to way in which institutional missions are achieved because of diversity and societal benefits are thought of as ways in which diversity “affects lives, policies, and issues beyond the walls of the institution – including the achievement of democratic ideals, the development of an education and involved citizenry and the way in which members of the most underserved groups in our society are able to receive the services they require” (p. 612 Milem & Umbach, 2003). Since this investigation focuses on diversity experiences and its role in student learning, educational outcomes that are thought to be enhanced and have been associated with diversity experiences will be presented herein. The intent of the next section is to bring attention to the number of different student outcomes linked with diversity experiences as well as to help understand the nature and breadth of student learning from such experiences.

Gurin et al. (2002) described two major types of student outcomes influenced by different types of diversity experiences: learning outcomes and democracy outcomes. Learning outcomes are the developments of skills that support active thinking and intellectual engagement (Gurin et al.). Milem, Umbach & Liang, (2004) more specifically defined learning outcomes as “active learning processes in which students become involved in while in college, the engagement and motivation that students exhibit, the learning and refinement of intellectual and academic skills and the value that students place on these skills” (p. 689, Milem et al.). Examples of such learning outcomes are student’s self-ratings of their overall academic ability and general knowledge, self-ratings on their writing, listening, analytical and problem solving skills, and their foreign language abilities. Accordingly, motivation to understand human

behavior and satisfaction with college, have also been identified as learning outcomes (Gurin et al., 2002).

Democracy outcomes are “ways in which higher education prepares students to become involved as active participants in society” (p. 689, Milem et al. 2004). Research has suggested that students who had the most experiences with diversity during college would be more motivated and better able to participate in society (Gurin et al., 2002). Measures of democratic outcomes are activities that affect society and political structure (Gurin et al., 2002). Democratic outcomes are identified as citizenship engagement, racial and cultural engagement, compatibility of differences and perspective-talking (Gurin et al., 2002). Citizenship engagement is the motivation to participate in activities that affect society and political structure. Racial and cultural engagement is the measure of students’ self rating on how much they have changed in cultural awareness and appreciation and acceptance of persons from different races and culture. Compatibility of difference refers to the understanding by students that there are common values across different racial and ethnic groups and finally perspective talking refers to the tendency to consider other people’s points of view (Gurin et al. 2002).

Milem (2003), as cited in Milem & Umbach, (2003), introduced the term “process outcomes” or ways in which students perceive that diversity has enriched their college experience. Measures of student satisfactions and perceptions of campus climate are examples of this type of outcome. Recently, Hurtado, Griffin, Arellano & Cuellar (2008) introduced a framework on student outcomes associated with diversity experiences to help educators understand how researchers and scholars have assessed diversity in the

college environments. Their framework originated from concept maps of student surveys and studying diversity literature. Their aim was to “illustrate” how researchers and scholars are beginning to capture multi-dimensional and complex research questions associated with diversity and importantly identify the student constructs and outcomes associated with diversity issues. The authors’ framework was intended “give more focus to the skills competencies and knowledge that frame personal and social responsibility in a multicultural society (p. 215, Hurtado et al., 2008). If anything, the framework as presented in Table 2.1 provides a clear and organized representation of the number of different outcomes that are affected by diversity experiences in college. The authors agree that this is not an exhausted listed of outcomes.

As identified in Table 2.1, four different areas of student outcomes are identified. Cognitive outcomes are students’ thinking skills. Several investigations have already linked diversity experiences with cognitive measures of critical thinking (Hurtado, 2001) openness to diversity (Pascarella, et al. 1996; Whitt et al., 2001) and attributional complexity (Bowman, 2010). Socio-cognitive outcomes are dispositions and skills that incorporate social awareness and imply awareness of interpersonal relations across groups that involve either social or cognitive abilities. Perspective talking (Gurin et al., 2002) and changes in leadership skills of an individual because of diversity experiences (Antonio, 2001) are examples from the socio-cognitive area. Multicultural citizenship outcomes are the student’s ability to interact with a variety of social identity groups and “are a set of skills and abilities to interact with a variety of social identity groups and to make decisions in a society marked by difference (p. 216, Hurtado et al., 2008). These

outcomes are much like the democratic outcomes outlined in Gurin et al., 2002) and help to identify a student's development in abilities to participate in a diverse workplace,

Table 2.1 Framework of Student Outcomes and Diversity Experiences

Cognitive	Socio-Cognitive	Citizenship in a Multicultural Society	Values & Attitudes
Analytical problem solving Critical thinking	Leadership skills Cultural Awareness	Pluralistic Orientation Civic responsibilities	Civic values Commonality of values
Openness to diversity Attributional complexity	Social identity awareness Self-efficacy	Interest in equity and social justice issues Voting behavior	Tolerance of differences
Socio-historical thinking Knowledge about different groups	Perspective talking skills Social awareness Self-confidence	Conception of democracy	Attitudes towards different identity groups

(Adapted from Hurtado et al. 2008).

interests in equity issues, and civic commitments and behaviors. Engberg (2007) recently reported students' development of a pluralistic orientation because of structural diversity on campus and Hurtado, Engberg, Ponjuan & Landers (2002) reported students' pre-college interactions are likely to improve democratic outcomes in college. The last column in Table 2.1 is entitled diversity values and attitudes. These are outcomes of tolerance and beliefs about diversity issues and topics (Hurtado et al., 2008).

Understanding student values and attitudes according to the authors is a first step in preparing them for interactions with diverse people and is also a key step in helping to resolve conflicts on campuses. In support of this, Hurtado (2005) reported students who

participated in extra-curricular diversity events tended to value social awareness and campus diversity initiatives more than students who did not participate in diversity-related events.

It is important to note that a clear focus of current research on diversity experiences is its impact on student outcomes. Less clear in the current research is the transformations or the processes students must encounter because of the diversity experience that ultimately leads to the improved student outcome. With an interest to contribute to the body of literature in this area, Nagda and Zuniga, (2003), looked at mediating processes that potentially influence student outcomes as a result of participating in an intergroup dialogue course (a diversity experience that engages students in the exploration of commonalities and differences among student groups). Forty-two college students from a large Midwestern university participated in the investigation; 55% of the students identified themselves as a minority and 81% were women. Of particular interest in this study was the development of a dialogical learning process scale-thought to bring meaning to a student's intergroup dialogue experience. Dialogical learning according to these investigators is "the sustained, structured, facilitated communication process that enables engagement across differences" (pg. 114). The learning scale was a nine-item survey (Chronbach's $\alpha = 0.82$) that addressed learning processes as it related to the intergroup dialogue diversity experience: peer facilitation, structured activities, being able to disagree, sharing views and experiences, asking questions, addressing difficult questions, working through disagreements and conflicts, and exploring ways to take action with people from different groups. Results

from the investigation not only indicated that the dialogical learning process indeed predicted significant and positive changes in five of the eight student outcomes measured, these results also provided strong evidence that students who most valued the dialogical learning process had more pronounced and positive changes in the student outcomes even after controlling for pre-test and racial and ethnic background characteristics. The implications from this study suggest that institutional efforts aimed at either creating or improving dialogical learning as it relates to the diversity experience captures the supportive processes necessary to improve student outcomes. Certainly, research in this area is warranted.

In the present investigation, the researcher hypothesized that diversity as defined by three types of diversity experiences evince student growth which then can be assessed by gains in student outcomes. The researcher specifically targeted learning outcomes that encompassed student realities in cognitive and socio-cognitive domains and attitudes and values about their campus and its environment (see Table 2.1). Importantly, all of the student outcomes in the present investigation are addressed specifically in the National Survey of Student Engagement (Kuh, 2001). These student outcomes have been linked positively to a number of different diversity experiences (Umbach & Kuh, 2006). A summary of the outcomes used in this investigation follow.

Gains in General Education

It is well known that gains in general and specific academic knowledge and gains in critical thinking are attributed to exposure to post secondary education although skills can vary in magnitude by race and gender (Pascarella & Terenzini, 2005). The NSSE has

direct questions that quantify students' general education gains. Students are asked to assess the extent that their institution contributed to writing and speaking effectively, and thinking critically and analytically. Umbach and Kuh (2006), and Pike (2006) have used the gains in education variable in their investigations respectively.

Gains in Personal and Social Development

College has a significant and positive effect on student's identity, self-esteem, interpersonal relationships and leadership skills (Pascarella & Terenzini, 2005). For example, students who were exposed to engagement activities in college were also more likely to score higher on self concept tests (Laird, 2005). Accordingly, Zuniga, Williams, & Berger (2005) found that engagement activities among college students in their study promoted more thought about personal prejudices and social justice issues. Gurin, Nagda and Lopez (2004) found engagement experiences had a positive effect on interest in national politics and participation in community service. The NSSE has direct questions that quantify gains in personal and social development. The line of questions asked students the extent to which their institution has contributed to their person and social codes of value, contributed to working with others, and contributed to participating in local politics and community service.

Supportive Campus Environment and College Satisfaction

Institutional environments that are perceived by students as affirming and inclusive and where expectations are communicated clearly contribute positively to student learning and development (Kuh et al. 2005). In addition, it is these factors that

also affect persistence and graduation rates (Kuh et al., 2005). As universities have become more diversified, there is no denial that different sub populations of college students have more trouble over other groups in graduating with a degree despite a trend of increased enrollment and the number of degrees conferred for all racial and ethnic groups in the last 20 years (National Center for Educational Statistics, 2008). Kuh et al. (2005) have characterized a supportive campus environment as an entity with a high-quality of student relationships with other students, living environments that provide both social and academic support, learning resources readily available, transition programs that welcome and affirm and perceptions of accessible faculty and staff. Institutions that foster activities and resources that characterize a supportive campus environment are likely report higher graduation rates and higher levels of satisfaction with college (Kuh et al., 2005). Supportive campus environment and college satisfaction in this investigation were quantified by student self-reported responses on the NSSE. The NSSE addresses supportive campus environment through a series of questions about the extent the institution emphasized academic, non-academic and social support needed to succeed in college. College satisfaction was addressed by a line of inquiry asking the student if they would attend the institution again if they had to start all over.

Several types of diversity experiences are present on college campuses (Gurin et al., 2002; Hurtado, 2008). The next section distinguishes between the types of diversity experiences and their relationships to a number of student outcomes.

Linking Diversity Experiences with Student Outcomes

The scholarship of diversity and its impact on college student outcomes continues to be a relevant and a significant line of inquiry especially since policy and programming and learning environments at institutions are certainly affected by a diverse student body (Chang, 1999; Gurin, 1999; Kuh, 2009). Structural diversity, informal interactional diversity, and coursework diversity (Antonio & Muriz, 2007; Gurin et al., 2002; Umbach & Kuh, 2006) are forms of diversity students experience on campus that can influence the way students think and behave. The following sections discuss the current literature on the impact of each form of diversity and its relationship to student outcomes in higher education.

Structural Diversity

Structural diversity refers to the numerical representation of student body groups at a higher education institution (Gurin et al., 2002; Umbach & Kuh, 2006). It is theorized that structural diversity at an institution increases the likelihood that a student will interact with someone from a different ethnic or racial background from their own (Umbach & Kuh, 2006). Further, if institutions improve representation of different ethnic and racial groups on campus, it will likely create the necessary environment for all students to experiment with new ideas, roles and relationships which in return, create the positive effects of diversity on student outcomes (Gurin, 2009).

Astin's work in 1993 was one of the first large-scaled, multi-institutional studies that examined among other variables: structural diversity and its relationship to student

outcomes. Astin's (1993) investigation was significant as it used longitudinal survey data from the Cooperative Institutional Research Program (CIRP) comparing data from entering freshman in 1985 and a follow-up survey administered to the same entering students four years later ($n = 24,487$). This design was thought to correct for previous methodological and data limitations. The size and scope of the CIRP data also made it possible to employ multivariate controls in the statistical analyses. Astin (1993) found that structural diversity, defined by the racial composition of an institution had a positive effect on the student outcomes of educational attainment, political identification and career choice. Beta coefficients however, were not reported in the text indicating the effects sizes of these relationships were small (Astin, 1993). But despite the small significance, Astin's results continue to be cited frequently today as these findings supported the benefits of having a racially and ethnically diverse student body. Accordingly his work raised a number of important issues regarding the benefits of a diverse student body even in a time where demographic trends and student characteristics were much different then today.

Chang (1999) also examined structural diversity and its impact on several college student outcomes using longitudinal survey data from CIRP (1985-1989, $n = 18,188$). After controlling for several pre-college characteristics and using a number of institutional characteristics (size and selectivity) as controls, Chang (1999) found that structural diversity had a small but significant effect on two student outcomes. Important in this work was the development of a mathematically relevant equation that replaced the conventional measure of structural diversity traditionally defined as the number of

students of color at an institution. The conventional measure assumed the more non-whites on campus, the more diverse the student body. Chang reasoned that this definition of structural diversity was flawed because homogeneous serving minority institutions could be considered racially diverse. His new index of structural diversity measured the variance in the student population across four different racial/ethnic groups. Institutions that have similar percentages of student groups across the four groups have higher diversity index scores than institutions that are rather homogeneous.

Using regression analyses, Chang (1999) in his investigation observed a small but statistically significant impact of structural diversity on the student outcomes of socializing with someone from a different race ($\beta = .12$) and discussing racial issues ($\beta = .02$). Chang, (1999) concluded that attending college with those of other races increases student's ability to socialize across racial lines and talk about racial matters which also mediated the positive impact on additional student outcomes (data not discussed). Although the researcher conceded to the small statistical significance, he added "given what we know about racial climate on U.S. campuses and the corrosive forces in society at large that impede dialogue and understanding, even a small positive impact may be extremely important" (p. 594).

Using a more current data set, a modified version of Chang's index for structural diversity, and the contention that institutional characteristics play a significant role in mediating student outcomes, Pike and Kuh, (2006) reported that structural diversity was significantly and positively related to interactional diversity (the opportunities for students to interact with someone from a different race, ethnicity, religious or political

background). Using data from the 2001 National Survey of Student Engagement (NSSE) and corresponding institutional data from the 2001 Integrated Postsecondary Education Data Survey (IPEDS) that addressed such institutional characteristics as size, control, mission and urbanicity, ($n = \sim 45,000$), these researchers concluded that a diverse student body is associated with higher levels of interaction among diverse groups. This relationship was accordingly stronger than for any other institutional characteristic described in the study. A standardized coefficient of 0.52 ($p < 0.05$) was reported for the relationship. Findings from this investigation continue to support the link between structural diversity and gains in student outcomes and offer continued support for implementing institutional diversity-based initiatives to support the changing student body.

Not all research investigations have found significant results linking structural diversity with college student outcomes. Recently, Denson & Chang (2009) sought to explain the benefits of diversity and its effect on student outcomes relying on both student and institutional level characteristics as units of analyses. Their investigation also utilized longitudinal CIRP data although from 1994-1998. Depending on the student outcome measured, the final sample population ranged from 19,794 to 19,978. Hierarchical linear modeling (HLM) was used to analyze the data which was considered a strength in the investigation for two reasons: it addressed the nested nature of national data sets and provided a better estimate of results that would reflect the different student and institutional levels. An extensive set of student and institutional controls were included to account for any possible influences on the outcomes identified in the

investigation. While other forms of diversity experiences were significantly related to the student outcomes measured in the investigation (discussed later in more detail later), Denson and Chang (2009) did not find a statistically significant relationship between structural diversity (“an institution’s percentage of underrepresented minority: measured as the combined proportional representation of African American, Latinos, and American Indians” p. 331) and the student outcomes of self-efficacy, academic skills and racial and cultural engagement. While these researchers were surprised by their results, they did suggest that the findings were too premature to conclude that racial composition of the student population does not matter.

Denson and Chang’s (2009) findings in part support Umbach and Kuh’s (2006) previous investigation that reported that institutions do not have to be “highly structurally diverse” to affect student outcomes positively. In their investigation of nearly 100,000 students using NSSE data, Umbach and Kuh, (2006) found that students at liberal arts colleges where low structural diversity indices were reported were more likely engage in diversity-like activities and understand diverse people than their peers from other types of institutions that had higher structural indices scores (effect sizes ranged from 0.19- 0.30 and 0.10 – 0.23 respectively). Data were analyzed using hierarchical linear modeling (HLM). Their findings suggested that liberal arts colleges which are not racially or socioeconomically diverse, somehow are deliberate in creating “distinctive learning environments,” presumable through other forms of diversity experiences that positively affect student outcomes (Umbach & Kuh, 2006). These results offer support for the

implementation of institutional diversity initiatives even at schools that are fairly racially and ethnically homogeneous.

One investigation uncovered in the literature suggested that increasing structural diversity on a campus can actually harm students (Rothman et al., 2002). In their highly critical article opposing the benefits of a racially diverse student body, these investigators claimed that the instruments used and the research designs employed in a number of previous studies were flawed and were the reasons behind the observed benefits of structural diversity concluded in a number of investigations. Rothman et al. questioned the inherent limitations of the use of opinions and self-reported surveys in many of the previously reported investigations since these types of surveys are subject to such problems as selective recall and socially appropriate responses and problems in the ability to infer behavior from self-reported perceptions. Finally, Rothman et al. stated that “survey questions can also push responses in the hypothesized direction” (p .12). To avoid such design problems, these researchers reported using an indirect approach to answer the research question: does enrollment diversity (i.e. structural diversity) affect student outcomes?

In their investigation, a cross-national survey of students, faculty and administration (140 institutions stratified by institutional type) were randomly selected (n = 4083) and interviewed in 1999. Only student results were reported (n = 1643) in the article. The student population was asked “non-controversial questions” about their perceptions of their educational experiences and campus environment. No direct questions about diversity were asked since the researchers implied that questions about

diversity are complex and can imply many different meanings to students. The student outcomes; perceptions of educational environment, and discrimination and treatment of minorities were the dependent variables measured in the study. Structural diversity was defined as the number of Black students enrolled in predominantly White institutions. Data on structural diversity were obtained from National Center for Educational Statistics (NCES). Bivariate correlations and multivariate analyses were reported.

Rothman et al. (2002) hypothesized if the benefits of structural diversity affect student outcomes, then the increased proportion of minority students at any given institution should positively correlate with the student outcomes representing positive perceptions of diversity on campus, greater satisfaction with college, and a better educational environment. Rothman et al. reported negative and significant ($p < .01$) correlations between structural diversity and all of the student outcomes measured in the investigation. These researchers found as the proportion of Black student's enrollment increased at an institution, student satisfaction with college ($r = -.08$), their work effort ($r = -.09$) and their overall assessment of quality of education experience ($r = -.14$) decreased. Multivariate regression analyses also found that structural diversity contributed significantly ($p < .01$) to explaining the variance in student evaluations of college after a set of demographic, academic and institutional characteristics were controlled for. That is, the higher the structural diversity index, the more likely students would report a decrease in their satisfaction with their quality of education ($\beta = -.120$), work effort ($\beta = -.133$) and satisfaction with the university experience ($\beta = -.089$).

Students were more likely to report forms of discrimination with a higher index as well ($\beta = -.102$).

While these results paint a dismal portrayal of the benefits of structural diversity (although only results can be generalized for the Black student population) no discussion as to the possible reasons for observing the negative analyses were presented by the researchers. The authors' main point of the discussion was to emphasize the need for more careful and rigorous testing of the arguments put forth by the proponents of diversity and the need for more stringent investigations. Interestingly, no meaningful explanation or documentation that supports their design and methodology was presented leaving the reader with wondering why their investigative measures should prevail over others. Further investigation as to why the negative effects of structural diversity on student outcomes were observed in this investigation is indeed warranted.

Simply increasing the number of students from underrepresented groups on campus does not automatically improve campus climate for diversity or improve learning outcomes according to Hurtado et al. (1999). However, a preponderance of data does suggest that increasing structural diversity on campus indirectly influences student learning through interactions with peer groups and through greater levels of student's engagement in diversity related activities, events and coursework (Chang, 1999; Gurin, 1999; Pike & Kuh, 2006). The next section discusses interactional diversity and coursework diversity as additional areas of diversity experiences that influence student outcomes and further support the diversity rationale in higher education.

Interactional Diversity and Coursework Diversity

The body of research that focuses on the benefits of structural diversity are likely to conclude that a diverse student body provides more opportunities for students to interact with someone from a different race, ethnicity, religious or political background. Student exchanges with diverse people and student exposure to diverse perspectives and ideas in and out of the classroom are defined as interactional diversity experiences (Umbach & Kuh, 2006). Accordingly, Chang, (2001) reported that changes in structural diversity on campuses can frequently and in a variety of ways create situations that constitute coursework diversity or classroom diversity. Coursework or classroom diversity (used interchangeably) involves the number and or nature of diversity-related initiatives institutions make available to students (Umbach & Kuh, 2006). Coursework diversity may be identified by but not limited to the following: multicultural or diversity events on campus, workshops on cultural or diversity awareness, and or racial and ethnic courses offered by institutions (Umbach & Kuh, 2006).

Hurtado (2007) believed that “substantial and meaningful interaction” is the key to how diversity affects student outcomes positively (p. 190). Accordingly, Gurin et al. (2002) contended that students who interact more with people who hold different views other than their own, will think and be challenged in novel ways that benefit student learning and improve student outcomes. These challenges that benefit student learning can also present itself in classroom situations where students are learning about cultures different from their own (Umbach & Kuh , 2006).

Several investigations have looked at the relationship between interactional diversity on a number of college student outcomes (Bowman, 2010; Gurin et al. 2002; Hurtado, 2007; Pascarella et al, 1996; Umbach & Kuh, 2006). Findings from many of these investigations have generally linked the benefits of interactional diversity with gains in the following student outcomes: cognitive development (Bowman, 2010 and references therein; Pascarella et al. 1996; Springer et al. 1996); democratic outcomes, intellectual engagement and motivation, and academic skills (Gurin et al, 2002; Umbach & Kuh, 2006); perspective talking and leaderships skills, (Antonio, 2001; Hurtado, 2005), and gains in personal and social development and satisfaction with college (Umbach & Kuh, 2006). The benefits of coursework and classroom diversity on gains in the following student outcomes: learning and intellectual development (Hurtado, 2001; Terenzini, Springer, Yeager, Pascarella & Nora, 1996; Pascarella et al. 2001; Umbach & Kuh, 2006), gains in social awareness (Gurin et al. 2002; Umbach & Kuh, 2006) and having a supportive campus environment (Umbach & Kuh, 2006) have also been identified in the literature.

In support of the diversity rationale in higher education, Gurin's et al. (2002) work on diversity and its impact on higher educational outcomes investigated the link between different forms of diversity experiences (interactional and classroom) on a broad range of student outcomes using two longitudinal data bases: one from the University of Michigan Student Survey (MSS) and the other from Cooperative Institutional Research Program (CIRP). Gurin et al. explained by examining the two data sets they were able to "identify broad patterns of educational benefits both within a single institution and across

varying institutional contexts” (p. 342). The MSS data set was a single institution’s survey of students who entered the University in 1990 and were administered a follow up survey four years later. The population of students involved in the MSS was 1582 with 72% of the population identifying themselves as White. The CIRP data, also longitudinal (1984-1989) included 11,383 students from 184 different institutions across the nation. The students also identified themselves as predominantly White (92%).

Informal interactional diversity in the CIRP data was an independent variable measured by a three item index summarizing the responses of students “the extent they had socialized with students from different race/ethnicity, discussed racial issues, and attended a cultural or racial workshop.” Interactional diversity using the MSS data was a four item index summarizing how student responded to the following questions: the amount of contact with students from other racial groups they had, the quality and frequency of meaningful and honest discussions about race and interethnic interactions, the frequency of attending multicultural events on campus and how each student described their six closest friends in college. In both data sets, classroom diversity was an independent variable identified by the response to the question if a student was enrolled in an ethnic studies course. In the MSS data set, an additional question that addressed if students were exposed to information or activities devoted to understanding other racial groups was also included in the measure.

The dependent variables in the investigation were measures of active thinking, engagement in learning, academic skills and democracy outcomes. More specifically, intellectual and engagement motivation in the CIRP data were self ratings of “drive to

achieve, intellectual self confidence, degree aspirations, interest in attending graduate school, importance in writing original work and creating artistic work.” The measure of academic skills using CIRP was an index of items in the following areas; self-rated academic ability, writing skills and writing ability, listening ability, general knowledge, analytical problem solving, critical thinking and foreign language skills. A set of democracy outcomes were also identified as dependent variables in the investigation since the authors theorized that students who experience diversity the most, would be more motivated and ready to participate in a pluralistic society. Citizen engagement or a students’ motivation to participate in activities that affect social and political structure and an index that measured cultural and racial engagement were the democracy outcomes measures using the CIRP data. In the MSS data, a 7-item measure of active thinking and a two item index measuring intellectual engagement and motivation were the learning outcomes evaluated in the investigation. An index of five items measuring a “compatibility of difference and democracy outcome” (perceived commonality in life values with groups other than ones own), a four-item index that measured “perspective taking” (tendency to consider other people’s point of view) and a single item measure that defined “racial and cultural engagement” (a self rating of the amount students learned) were the democracy outcomes using the MSS data. To address the research questions, block hierarchical regression was the statistical approach in their investigation. Model 1 was conducted to determine how each individual diversity experience predicted student outcomes. Model 2 determined the effects of each diversity experience on student outcomes while controlling for the other diversity measures in the investigation.

This approach allowed the researchers to examine the individual effect of each diversity experience on student outcomes as well as its net effects. A strength of this investigation was that separate regressions were fit for the different student populations (White, African American, Latino/a, and Asian American for CIRP data and White, African American, and Asian American for the MSS data).

Results from both survey sets (MSS and CIRP) empirically supported that diversity experiences and especially interactional diversity had “robust effects” on most educational outcomes identified in the investigation and for all groups of students, although to varying degrees. For example, in the CIRP data, as a sole predictor, interactional diversity was significantly influential in accounting for the student outcomes of intellectual engagement and self-reported academic skills (Table 2.2) for all student groups.

Table 2.2 Effect of Interactional Diversity on Student Outcomes

<u>Whites</u>	Beta	<u>Asian Americans</u>	Beta
Intell. Engagement	.130**	Intell.Engagement	.170***
Academic Skills	.168***	Academic Skills	.134**
<u>African American</u>	Beta	<u>Latino</u>	Beta
Intell. Engagement	.146**	Intell.Engagement	.138**
Academic Skills	.175***	Academic Skills	.258***

** (p < .01), *** (p < .001)

In addition, the net effect of interactional diversity on intellectual engagement and academic skills remained significant for most groups (data not shown). For all student groups in the CIRP data, significant relationships for interactional diversity with all

democracy outcomes were also reported in the first model and remained statistically significant even after controlling for other diversity experiences (data not shown).

In the MSS data, as a sole predictor, the only Beta significant for interactional diversity was for the student outcome, active thinking (Beta = .100, $p < .001$) and only for the White student population (Table 2.3). The significance remained for this population even after control measure were employed in Model 2 (Beta = 0.054, $p < .05$).

Table 2.3- Effect of Interactional Diversity on Student Outcomes

<u>Whites</u>	Beta	<u>Asian Americans</u>	Beta
Intell. Engagement	.084	Intell.Engagement	.086
Active Thinking	.100***	Active Thinking	.077
<u>African American</u>	Beta		
Intell. Engagement	.117		
Active Thinking	.019		

*** ($p < .001$)

The net effect of interactional diversity became statistically significant in Model 2 for African Americans and Asian Americans on the student outcomes of intellectual engagement (Beta .166 $p < .05$) and the active thinking (Beta .102 $p < .05$) respectively. For the democracy student outcomes, as a sole predictor, interactional diversity was statistically significant with all democracy outcomes identified in the investigation and remained significant even after controlling for other forms of diversity experiences for the White student group. For both African American and Asian American student groups, only one democracy outcome, compatibility of difference, was significant in

Model 1 and remained statistically significant in Model 2 (Model 2, Beta .262 and .197, $p < .05$ respectively).

Findings from the CIRP data suggested the impact of classroom diversity was highly influential on most groups and on nearly all student outcomes (Betas ranged from .057- .205 $p < .01$ - .001) and democracy outcomes (Betas ranged from .138 - .214 $p < .001$) using Model 1. The statistical significance disappeared for Asian Americans on both student and democracy outcomes after examining the net effect of this relationship. In Model 2, one statistically significant but negative result (Beta = -.125 $p < .05$) appeared for African Americans and academic skills. In the MSS data and with a few exceptions, most groups reported statistically significant relationships between classroom diversity and student and democracy outcomes. The relationships remained statistically significant for all outcomes and for all groups when studying the net effects of classroom diversity.

Gurin's et al. (2002) results are significant for many reasons. Their findings suggest that interactions with diverse peers on campus and aspects of classroom diversity significantly and positively impact a number of student outcomes. Gurin et al. hypothesized that colleges provide the setting to which students experience "disequilibrium" and theorized that "confrontation with diversity" as part of this disequilibrium fosters meaningful growth. Hurtado (2007) wrote "diversity in the student body provides the kind of experience base and discontinuity needed to evince more active thinking processes among students, moving them from their own embedded worldviews to consider those of another (or those of their diverse peers)" (p. 189). To enhance

student growth and development, the challenge for most institutions and educators then is to “overcome incredible inertia in student’s thinking habits” (p. 189 Hurtado, 2007) and provide opportunities for meaningful interactions and coursework central to diversity.

Importantly, Gurin et al. (2002) results link diversity experiences with student outcomes and the significance appears in different racial and ethnic groups on campus. This suggests that many different student groups benefit from diversity although differentially. Earlier investigations from Pascarella et al. (1996) and Whitt et al. (2001) found conditional effects of diversity experiences on student outcomes using survey data from the National Study of Student Learning (1993-1996). Participation in a racial or cultural awareness workshop and living on campus each had a significantly stronger effect on the openness to diversity outcome for White students than for their Nonwhite counterparts after a student’s first year of college (Pascarella et al., 1996). Whitt et al. (2001) also found that women and students of color had higher levels of openness to diversity than their respective counterparts after their second and third years of college. Zuniger, Williams & Berger (2005) found in their investigation that females have higher levels of motivation to reduce their own prejudices or promote inclusion and social justice, take diversity related courses and interact with someone different from themselves than their male counterparts. Gurin et al. (2002) and Hurtado et al. (2003) also found women scored higher on outcomes associated with participation in democracy than men.

Understanding the differential impact of diversity experiences on student outcomes is complex as institutional environments, academic and non-academics

experiences and student characteristics influence student development (Astin, 1993; Gurin et al., 2002; Pascarella & Terenzini, 2005; Whitt et al., 2001). The educational possibilities associated with individual, group and institutional levels are also interrelated further complicating the results of the benefits of diversity for different groups of students on campus. In reviewing the literature on the conditional effects of diversity experiences on student outcomes, many investigations have looked at the conditional effects of diversity experiences but not as the main research questions. Often discussions about conditional effects are overlooked especially with regard to how different racial and ethnic subgroups experience diversity (Gurin et al., 2002; Denson & Chang, 2009). It clear that more research on the conditional effects of diversity and its relationship to student outcomes is needed.

The importance in uncovering which institutional qualities or characteristics may maximize student outcomes with regard to different diversity experiences was an important extension of the diversity literature in the last decade. Hu and Kuh (2003) found that students from both doctoral universities and liberal arts colleges had more experiences with diversity-related activities than students from other types of institutions. While the former result is not that surprising, the latter result was surprising since liberal arts institutions often are regarded as demographically homogeneous. Hu and Kuh (2003) also found students at private colleges were more likely to interact with someone of a different race or ethnicity than students from a doctoral research university. Again, these results speak to those institutions that may not be able to provide the structural diversity benefits associated with student learning as reported in the literature but can

undoubtedly create environments and opportunities through classroom or activities that strengthen or reinforce student learning.

A follow-up to their investigation, Umbach and Kuh's (2006) also examined how students at liberal arts colleges compared to their counterparts at other types of institutions in terms of their diversity experiences. Two overlapping samples of students were used in the investigation. The first sample consisted of 98,744 students from 349 four year colleges and universities who answered the NSSE in 2002. The second sample of students was from a subset of the larger sample and included 17,640 students from liberal arts colleges only. As an independent variable, interactional diversity was identified by a 2-item measure that asked students their response to the frequency in which they had conversations with students of different race or ethnicity, and the frequency in which they had conversations with students who were different in their religious beliefs, political opinions or personal values. Coursework diversity, also an independent variable was defined as the extent to which students reported their classes included readings or discussions related to diversity. The dependent variables in the investigation included items that measured personal and social gains, gains in social awareness and academic challenges, and having a supportive campus environment. A cumulative index of diversity-related activities was also a dependent variable identified in the study as well as a self-reported gain in understanding diverse people (or people from different backgrounds). HLM was the statistical approach used in answering the research questions and a set of controls for student and institutional characteristics were also employed. The results unequivocally demonstrated that students at liberal arts

colleges were more likely to engage in diversity-related activities than their peers at other types of colleges (effect sizes ranging from .19 to .30). This relationship was observed for both first year and senior year classes. Students at liberal arts colleges also reported higher gains in understanding diverse people than their counterparts at other institutions (effect sizes ranging from .10 to .23). For students at liberal arts colleges only, a significant and positive relationship between interactional diversity and nearly all student outcomes measured in the investigation were reported. This trend was also consistent for both first year and senior year students. Effect sizes ranged from .06 to .27 ($p < .05$). The relationships of coursework diversity with all the students outcomes identified in the investigation were statistically significant as well for both first year and senior year students (effect size ranging from .05- .26; $p < .05$).

These results suggest that liberal arts colleges which are not highly structurally diverse institutions according to (Umbach & Kuh, 2006) can create experiences and create the climate necessary to foster meaningful diversity experiences that in return affect student development. The moderate effect sized reported for interactional diversity and coursework diversity on a number of student outcomes suggests that institutions can look to the curriculum and campus events to cultivate skills necessary to work and live in a diverse society (Umbach & Kuh, 2006) even as it pertains to less structurally diverse environments.

In a more recent investigation, Denson and Chang (2009) looked to explain the influence of diversity experiences on a number of student outcomes through an organizational or sociological lens. Their theoretical approach cited Berger's (2000)

investigation which inferred that “different patterns of organizational behavior do indeed affect student outcomes on various ways for different students” and that “levels of organizational behavior create intense organizational environments that exert stronger uniform effects on student outcomes” (as cited in Denson & Chang, 2009; p. 328). Thus, Denson and Chan (2009) suggested that the institutional environment as it relates to diversity may have far more reaching effects on student outcomes than previously identified in the literature. According to the investigators “if an institution’s mission includes diversity and is articulated in a cohesive and consistent way, then higher levels of organizational behavior as measured by a student body’s engagement in diversity, for example, can create more intense environments that exert strong uniform effects on all students’ capacity to engage in diversity” (p.328). Further, the possibility that those students who even though “may feel hostile or disengaged from diversity experiences” may in fact be positively affected just from being in an environment where a significant proportion of students are engaged in these types of opportunities (Denson & Chang, 2009). Two important questions were asked in the study: (1) Do different forms or expressions of campus racial diversity contribute uniquely to students’ learning and educational experiences when they are simultaneously tested, while accounting for the nested structure of multi-level data? And (2) does a campus where students take greater advantage of those racial diversity-related opportunities, have independent positive effects on students’ learning and educational experiences?

Data from this investigation were drawn from CIRP utilizing two surveys administered at two different times (1994-1998): a first year survey and the same survey

administered four years later but included additional experiences that the student may have been involved in during college. Depending on the student outcome measured, the final sample population ranged from 19,794 to 19,978 (due to pairwise deletion). Interactional diversity also labeled as CRI (cross-racial interaction) was a composite of five measures on the CIRP survey that tapped into student's engagement level with someone of a different race-ethnic group at college in the following activities: studying, dining, dating, socializing and interacting. Curricular diversity was a composite of three survey questions that asked the following questions: taken an ethnic course, attended a racial or cultural workshop and participated in an ethnic/racial student organization since entering college. Three student outcomes were the dependent variables in the investigation: self efficacy, general academic skills and racial-cultural engagement. Multilevel HLM was the statistical method employed to more accurately assess the impact of diversity experiences at both the institutional and student levels. At the institutional level analysis, the "average" institutional measures of the independent variables were used. A set of pretest measures, student background characteristics, and institutional characteristics were identified as control variables.

The results from this investigation suggested that students who interacted more with others of a different race were likely to report higher levels of self efficacy, gains in academic skills and racial/cultural engagement. Accordingly, students who took a diversity course or were more involved in cultural workshops were also likely to report higher gains in self efficacy, academic skills and cultural engagement. Coefficients for the CRI predicted at the student level were statistically significant for the outcomes of

self efficacy, academic skills and racial/cultural engagement ($\beta = 0.14, t = 7.39$; $\beta = 0.16, t = 9.74$; and $\beta = 0.35, t = 32.28$, respectively, $p < .001$). Coefficients for curricular diversity were statistically significant at the student level as well ($\beta = .08, t = 4.01$; $\beta = 0.17, t = 10.4$; and $\beta = 0.22, t = 18.57$ for each outcome respectively, $p < .001$).

Results reported from institutional level analyses revealed that the peer group average measures of CRI also had a positive and significant effect on student's racial/cultural engagement ($\beta = 0.32, t = 5.47, p < .001$) but not on the student outcomes of self-efficacy and general academic skills. Results for peer group average curricular diversity had significant effects on both academic skills and cultural engagement ($\beta = 0.31, t = 3.84$; $\beta = 0.24, t = 4.09$ respectively). These findings are particularly impressive according to the authors since it suggests that those who attend institutions where more students are participating in an ethnic course or workshop are likely to report gains in academics and racial and cultural engagement independent of their own level of participation. Results also found the peer average measure of CRI "attenuated the relationship" between individual CRI and racial cultural engagement. As the average level of institutional CRI dropped, the stronger the positive relationship between individual CRI and racial/cultural engagement was observed. According to the authors, the benefits of interaction with someone of another race or ethnicity on cultural engagement are more significant for students when their peers are interacting less frequently. This implies when trying to achieve this type of engagement, students own level of CRI is far more important when such an interaction is absent among the student population on campus. This study confirmed the positive educational benefits associated

with interactional and coursework diversity, they further acknowledged that the contextual effects of diversity as are far more reaching than previously reported in the literature. According to Denson & Chang, (2009),

if higher levels of student body engagement with diversity signal more cohesive and consistent positive organizational behavior toward diversity, then the positive effects of greater student body engagement can be interpreted as a result of a more intense environment shaped by institutional practices, and shifting student needs which enhances the benefits of student diversity (pg. 345).

As summarized in many of these investigations when institutions commit to diversity experiences, the quality of a student's education is enhanced (Denson & Chang, 2009; Gurin et al. 2002; Hurtado, 2003; Pascarella & Terenzini, 2005; Umbach & Kuh, 2006). Several critical points about the diversity literature are presented in the next section.

Critique of the Diversity Literature

In reviewing the extant literature on diversity experiences and student outcomes, several trends are apparent. Most literature reviewed were quantitative investigations, however, some qualitative investigations presented in this chapter helped to establish the benefits of experiencing diversity on campus. Most quantitative investigations reported using a large national, multi-institutional, student survey data base from the last three decades to help analyze the research questions. Most statistical analyses reported in the investigation were complex forms of multilevel regression. Interestingly, Rothman's et al. (2002) was one of the few investigations that did not use a national student data base to analyze their research questions. And interestingly, in his investigation, he suggested that diversity experiences negatively impact college student outcomes.

The use of large national data sets does draw some concern as the possibility that these large data sets can mask the conditional effects of diversity experiences. With this information few single institutional studies were uncovered in the literature. The NSSE website does provide access to how single institutions are reporting their findings, there is still a lack of publications that address single institutions and how their “lone” results may compare to the general effects reported for diversity experiences. Findings from single institutional reports and how they compare to multi-institutional data sets would contribute significantly to current literature.

Some investigations have reported the conditional effects of diversity experiences on student outcomes especially uncovering differences among racial and ethnic groups. Gurin et al. (2002) results are intriguing in that they found differential effects of diversity experiences on student outcomes among different racial and ethnic student groups. However, they failed to discuss the results in greater detail. This is not surprising given that the overall results provided empirical evidence that diversity experiences do benefit all types of students.

In Villalpando’s (2002) national study on the impact of diversity experiences on college satisfaction, results indicated that college satisfaction was indeed enhanced after attending a racial or cultural workshop on campus or socializing with someone from a different race or ethnicity. Accordingly, the effects of environmental measures of diversity (taking courses from faculty whose content included diversity issues and the institutional emphasis of diversity) on college satisfaction was also statistically relevant. However, results did vary among the racial and ethnic groups in the investigation. In

discussing the coursework diversity variable, the effect was significant for only African American ($\beta = 0.09, p < .01$) and White students ($\beta = 0.09, p < .01$). Positive coefficients were reported for both Asian and Chicano students, although these results were not statistically significant. Findings from this investigation also revealed that college satisfaction was also enhanced after socializing with someone from a different race or ethnicity. Identical coefficients were reported for Asian and White student populations ($\beta = 0.09, p < .01$), however, a non-significant coefficient was reported for the Chicano student population ($\beta = 0.04$). A surprising negative coefficient was reported for African American students ($\beta = -0.02$). Results also revealed that student's overall satisfaction with college was strongly affected by institutional emphasis on diversity with one exception, Chicano students were negatively effected ($\beta = -0.02$, statistically non-significant). African Americans ($\beta = 0.13, p < .01$) Asian ($\beta = 0.11, p < .01$) and White students ($\beta = 0.07, p < .01$) reported stronger and significant effects for this diversity measure. Collectively, these results suggest that diversity experiences generally have positive effects on the college satisfaction but the strength of the relationships vary across different racial and ethnic groups on campus.

In his article, *How College Affects Students: Ten Directions for Future Research*, Pascarella (2006) suggests researchers acknowledge the increasing diversity of the student body. He stated "we can no longer plan an effective research agenda based on the assumption that our undergraduate student population is made up of White undergraduates from middle or upper-middle class homes, ages 18-22, attending four-year institutions full time, living on campus, not working and having few if any family

responsibilities” (p. 512). Further, he suggested that we as researcher should routinely anticipate that the “dramatically increased diversity of student characteristics and traits might itself shape the impact of college” (p. 512). The need to report the conditional effects of diversity experiences on student outcomes is an important extension to the diversity literature.

While much of the research has summarized the benefits of a number of diversity experiences on student outcomes, there is one critical point in many of these investigations especially with the CIRP data that warrants attention. Researchers continue to use data from the late 1980s and 1990s to generalize results for today’s student population. Given the dramatic changes in student demographics even in the last 10 years, this is an important limitation in the current research on diversity experiences and student outcomes. It is it is apparent that most investigations try to define the different types of diversity experiences similarly and define student outcomes similarly. Many of these investigations suggest that interactional diversity is based only on race and ethnicity, given the change in student characteristics today we may need to expand our notion of diversity to include interactions that may just focus beyond race and ethnicity and include religion, sexual orientation, years in school, and socioeconomic status in the diversity model.

Finally, students come to college with a variety of personal, social, family, and academic experiences; all which are certain to shape and influence attitudes in college and college student outcomes. High-school grades, grade point average, gender, age, personality traits, SES, hours spent studying, developing a meaningful philosophy of life,

motivation and expectation of college have all been found to influence a number of student outcomes (Bauer & Liang, 2003; Cole, Kennedy and Ben-Avie, 2009; Pascarella & Terenzini, 2005; Milem & Umbach, 2005; Robbins, He, Davis, Lauver, & Langley, 2004). Many researchers of the diversity literature purport the need to include backgrounds and precollege characteristics of students in their studies and do provide the baseline information in their analyses; others do not. The importance of such information should not be overlooked.

Chapter Summary

In this chapter, a review of relevant literature contributing to understanding the research problem was presented. The information presented herein focused on student engagement; the diversity rationale in higher education; student outcomes; and the link between diversity experiences and student outcomes. The next chapter discusses the methodology of this investigation.

CHAPTER 3

METHODOLOGY

Introduction

The purpose of this study was to understand the impact of student's engagement in diversity experiences on self-reported college outcomes among different groups of undergraduate students at Montana State University. The methodology used in this investigation is presented within. Descriptions of the research design, sampling method, the sample population, the independent and dependent variables, the statistical approach and analyses are also presented.

Context of the Study

Montana State University (MSU) is a public land grant university in Bozeman Montana. It serves approximately 12,000 students of which 72% are Montanan residents and 28% are from out of state or abroad. Eighty-five percent of the students are White, and Native Americans (3%) represent the next largest ethnic group on campus. Males (53%) slightly outnumber females (47%) on campus. MSU offers both undergraduate and graduate degrees in a wide variety of programs (www.montana.edu).

It is clear from the above figures that the institution is demographically homogeneous. However, MSU continues to strive for diversity in both their student body and students' experiences since at a glance, several important structural features are in place at the University; (a) a statement of diversity on their website

(www.montana.edu/president/prescom/diversity.html); (b) a diversity awareness office, (c) a Native American Student Center, (d) a women's center, and (e) various other student organizations (reported at www.montana.edu) are reputed to offer diverse and multicultural experiences. MSU also has academic programs for traditionally under-represented students on campus and has programs in place that intentionally recruit under-represented students. CORE 2.0 is MSU's core curriculum for all undergraduates and students must complete one foundation course in diversity in order to graduate.

In 2007 and 2008, MSU students were asked to participate in the National Survey of Student Engagement (NSSE). The survey is administered to first year and senior year students to measure the extent to which students are engaged in educational practices. These practices have been linked to learning, student development and desired college outcomes (National Survey of Student Engagement Institutional Report, 2008), suggesting that institutions who participate in the survey will glean valuable information on their student's engagement in educational practices.

For a participation fee, this web-based survey was administered to willing first year and senior year students at MSU. The NSSE survey collects information on student demographics and has specific benchmarks that are inclusive of diversity experiences and inclusive of desirable college student outcomes. Data from the surveys were collected and analyzed by NSSE administration at the University of Indiana and formal reports along with data sets were sent to the Office of Planning and Analysis at MSU. The data is available to MSU constituencies interested in student engagement issues in higher

education. The secondary data sets were used to answer the research questions posed in this investigation.

The relevance in using the NSSE data sets for this investigation is two-fold. First, it is apparent from the demographic statistics that MSU has a fairly homogeneous student population in terms of race and ethnicity. However, it is important to identify how different student groups perceive diversity and its effect on a number of student outcomes regardless of student body composition. Information may reveal how students on campus perceive diversity experiences in a context of learning and of social and personal development. Secondly, the NSSE data sets are available for analyses. Greater understanding of and knowledge about the role of diversity will be uncovered as other research investigations use the same data but employ different research and statistical approaches, as is the case in the current research. Indeed, no other quantitative research dissertations on diversity issues using data from MSU students were found by the researcher in the past decade. However, one qualitative dissertation from Mary Skelly (2005) entitled “Campus Climate and Diversity Issues: Listening to Students” was uncovered.

Research Design

This investigation employed a quantitative analysis design using secondary survey data to answer the research questions presented. Survey data from undergraduates at MSU who participated in the National Survey of Student Engagement in 2007 and 2008 were the data sets used to inform this investigation. The NSSE data sets are current

and the information drawn from the analyses will provide information about MSU student's undergraduate experiences.

Sampling Methods

The sample for this study was drawn from first year and senior year undergraduate students at MSU who completed the NSSE in either 2007 or 2008. NSSE personnel at Indiana University Center for Postsecondary Research handled the administration of the survey, data collection, and some descriptive analyses (www.nsse.iub.edu). Montana State University's Office of Planning and Analysis (OPA) provided student data files of all first year and senior year students attending MSU to the NSSE administration during the spring semesters of 2007 and 2008. Subsequently, NSSE sent electronic invitations of participation to all first and senior year students at MSU along with a link to the survey. Student responses were submitted directly to NSSE administrators for tracking and analysis. To improve response rates, NSSE sent a follow-up e-mail and a link to the survey to all non-respondents.

Comprehensive institutional reports provided by NSSE administrators were compiled and sent to the OPA at MSU approximately six months after students completed the survey. In addition, raw and weighted data files of student responses were sent to OPA for further institutional research and analyses. A sample copy of the 2008 NSSE survey appears at the following web address:

http://nsse.iub.edu/html/survey_instruments_2008.cfm

Sample Participants

For the purpose of this investigation, both 2007 and 2008 data sets were combined and analyzed as one large data set. Justification for combining these data sets were to improve the overall number of participants in the investigation. To bring some understanding of the sample population, NSSE administrators provided institutional reports to MSU. From these supporting documents, information on the study population was evaluated. Table 3.1 identifies the sample population of undergraduates initially identified for the present investigation. NSSE invited 3,592 first year students at MSU to complete the survey and 996 students responded to the survey for an overall response rate of 28%. For senior year students at MSU, NSSE administrators sent the survey link to 3,506 students and 1057 completed the survey for an overall response rate of 30%. Table 3.2 provides additional data on select student characteristics of the undergraduate population who participated in the NSSE as provided by the institutional reports.

The sample of MSU students participating in the NSSE appears to have some different demographic characteristics when compared to the student population at the MSU. According to the reported statistics for students enrolled in their first year at MSU during the Fall of 2007 (www.montana.edu/opa), 56% were male and 44% were female. For those students who completed the NSSE, data combined for years 2007 and 2008, 46% were male and 54% were female. For seniors attending MSU, the gender profile for both 2007 and 2008 fall enrollments as reported from the MSU website revealed that 53% of the students were male and 47% were female. For those seniors who participated

in the NSSE, 48% were male, and 52% were female. Equal representation of both male and female (50%) participated in the NSSE.

Table 3.1 MSU Survey Sample Participants

Year	Surveys Sent		# of Respondents		Response Rate	
	FY	SY	FY ^a	SY ^b	FY	SY
2007	1962	1979	469	510	24%	26%
2008	1630	1527	527	547	32%	36%
Total	3592	3506	996	1057	28%	30%

^aFY = First Year; ^bSY = Senior year

Table 3.2 NSSE vs MSU Student Population Characteristics

	NSSE-FY ^a	NSSE-SY ^b	MSU-FY ^{ac}	MSU-SY ^{bc}
Gender				
Male	46 %	50 %	56 %	53 %
Female	54 %	50 %	44 %	47 %
Race/Ethnicity				
African American/Black	0	0	< 1 % ^d	
Amer. Indian/Alaskan Native	2 %	2 %	3 %	
Asian/Asian Ameri./Pacific Islander	1 %	2 %	1 %	
Caucasian/White	92 %	89 %	84 %	
Hispanic	1 %	1 %	2 %	
Foreign	3 %	2 %	3 %	
Other	0	1 %	< 1 %	
Unknown	1 %	3 %	7 %	
Enrollment Status				
Full-time	92 %	90 %	88%	86%
Part-time	8 %	10 %	12%	14%

^aFY = First Year, ^bSY = Senior Year

^c = based on Fall 2007-student demographics

^d = reported for entire MSU population Fall 2007

Demographic characteristics for race and ethnicity for the MSU student population were presented as percentages based on the entire student body population and were not reported by year in school status as queried in the NSSE (see Table 3.2). MSU

reported that 84% of the entire student body is White which is a lower percentage of students that participated in the NSSE sample (92% FY and 90% SY). Accordingly, MSU reported 15% of the students are either Native American (3%), African American < 1 %) Hispanic (2%), Other (1%), Unknown, (6%) or International (3%) respectively (www.montana.edu/opa) and fairly consistent with the NSSE sample. All statistical analyses were controlled for the demographic variables in Table 3.2, which mitigated the differences between the NSSE samples and the population of MSU students.

Instrument

The instrument used in this investigation is the National Survey of Student Engagement (2007 and 2008). The survey is administered annually to hundreds of interested colleges and universities nationwide. The results provide an estimate of how undergraduates spend their time in college and what they gain from attending college. See Appendix A for more information about the NSSE survey.

Variables

The NSSE is specifically designed to understand the extent to which student's are engaged in educational activities. These educational activities have been empirically linked with student learning and development and other student outcomes such as college satisfaction, persistence and graduation (Kuh, 2001). To provide a framework to report student engagement and institutional performance using the NSSE, five benchmarks were initially developed (Kuh, 2001). Student performance on these benchmarks provides individual institutions with general assessment information (Kuh, 2001).

To increase NSSE's utility, Pike (2006) created twelve scalelets using questions from the NSSE survey. Pike (2006) purports using scalelets allows assessment professionals within an institution, to present data that are relevant and specific to that institution. A scalelet consists of a group of survey questions related to a specific educational experience of students (Pike, 2006). Scalelets align well with the content of the five NSSE benchmarks but offer more specific information and explanatory power about engagement experiences at an institution. The twelve scalelets have proven to be dependable and meaningful measures for assessing student engagement experiences (Pike, 2006).

Some of the scalelets are comprised of only one or two items from the NSSE which draws some concern to the researcher. However, Pike (2006) justifies the use of a small number of items on the NSSE that make up certain scalelets because questions relate to a specific student engagement activity or experience. Pike (2006) states that "although the ideal would be to base generalizations about student experiences on all possible questions about those experiences, the reality of survey research requires that assessment professionals base their conclusions on responses to a sample of questions" (p. 552). He further adds that "in effect there is a continuum ranging from very broad generalizations based on many survey questions to specific conclusions based on a single item. Scalelets "strike a balance between the breadth of generalizations and the number of questions in a survey" (p. 552). A number of other investigations have used Pike's scalelets to guide their research and statistical analyses and, in doing so, validates the scalelets (Kinzie, Thomas, Palmer, Umbach & Kuh, 2007; Umbach & Kuh, 2006).

In the present investigation, the researcher used four scalelets for measuring the self-reported student outcomes of (1) supportive campus environment, (2) gains in personal and social development, (3) gains in general education, and (4) institutional satisfaction. These four outcomes are the dependent variables in this investigation (Cronbach's $\alpha = .77$).

Pike (2006) created a diversity scalelet to represent the mean score of four items from the NSSE. However, Umbach and Kuh (2006) used the individual items that make up the diversity scalelet to represent different contexts of diversity experiences. The researcher used this approach as well. That is, instead of using one mean score to represent diversity experiences as suggested by Pike's scalelet, three independent variables of diversity experiences were used to define the different diversity experiences of students in this investigation: coursework in diversity, interactional diversity, and climate for diversity (Cronbach's $\alpha = .65$). These three items represent specific questions on the NSSE. Other independent variables in the investigation are gender, and race and ethnicity. Details of all the variables appear in Appendix B but are discussed in more detail below.

Coding and Recoding

Data were initially coded as presented in the 2007 and 2008 NSSE Codebooks (www.nsse.iub.edu). For this investigation, some variable responses were re-coded in order for the data to be analyzed using ordinary least squares regression (OLS). An important assumption of using OLS is that data are interval and continuous and normally distributed. Student responses from the four student outcomes dependent variables and the diversity independent variables are coded initially as Likert scales responses. A

scalelet that contains two or more survey questions was computed as the mean (Chen et al., 2009).

Independent Variables

The focal independent variables in this investigation are diversity experiences. Three measures of diversity experiences were explored: diversity in coursework, interactional diversity and climate for diversity. Diversity in coursework is a one item question from the NSSE asking students the extent to which they include diverse perspectives in their coursework. Responses were coded as 1 = never, 2 = sometimes, 3 = often and 4 = very often. Interactional diversity experience asks the following questions: had conversations with students of a different race or ethnicity and had conversation with students who differed in political, personal or religious views from themselves. Both responses were coded as 1 = never, 2 = sometimes, 3 = often and 4 = very often. The interactional diversity score was the mean value of the two items, which ranged from 1-4. Climate for diversity experience was a one item question from the NSSE that asks students the extent to which the campus environment emphasized contact among students from different social, economic or racial and ethnic background. Responses were coded as 1 = little, 2 = some, 3 = quite a bit, 4 = very much. All data from the diversity experience measures are considered interval.

The NSSE asks students to answer questions identifying their gender and race and ethnicity. Responses were used as independent variables (IV) in this investigation. The IV “gender” is a categorical variable with a dichotomous response. Gender was re-coded where 0 = Male and 1 = Female. Race and ethnicity is a categorical variable and

in this investigation is an independent variable. Based on the homogeneity of the sample, six dummy variables were created for the racial categories. The six racial categories were White (1 = yes; 0 = no); American Indian or Native American (1 = yes; 0 = no); Asian, (1 = yes; 0 = no); Hispanic (1 = yes; 0 = no); Prefer not to Respond (1 = yes; 0 = no); and Other (1 = yes; 0 = no). The Other category includes those students who identified as either Black or Multiracial.

Dependent Variables

The dependent variables (DV) used in this investigation were measures of different self-reported student outcomes identified in the NSSE. The DV, “institutional satisfaction”, was a two-item scalelet that evaluated students’ perception of their educational experience using the following questions: (1) How would you evaluate your entire educational experiences at this institution? Responses to this question were initially coded with 1 = poor, 2 = fair, 3= good, and 4 = excellent. The second question asked, if you could start over again, would you go to the same institution? Responses were coded initially as 1 = definitely no, 2 = probably no, 3 = probably yes, and 4 = definitely yes. Because the institutional satisfaction variable had two different Likert response sets, all responses were converted to z-scores and the mean z-score was computed.

The DV, “gains in personal and social development” was a seven-item scalelet that represented students’ perception of the gains they have made personally and socially as a result of their experiences at college. The scalelet asked the following questions: To what extent has your experiences at this institution contributed to (1) developing a personal code of values and ethics, (2) improving the welfare of your community, (3)

understanding yourself, (4) working effectively with others, (5) voting in local, state or national elections, (6) developing a deepened sense of spirituality, and (7) understanding people of other racial and ethnic background. The scalelet score was the mean score of the seven items using the following coded responses for each item: 1= very little, 2 = some, 3 = quite a bit, 4 = very much. The range of mean scores was from 1-4.

The third DV, “gains in education”, was a four-item scalelet that represents student’s perception of having made gains in the educational areas of writing, speaking, thinking critically and acquiring a general education as a result of their experiences at college. Responses were coded as: 1 = very little, 2 = some, 3 = quite a bit, 4 = very much. The scalelet score was the mean score of the four items.

The fourth DV was how students responded to a three-item scalelet that measured their perception of having a supportive campus. These questions addressed, to what extent does your institution emphasize the following: (1) providing the support you need to succeed academically, (2) helping you cope with you non-academic responsibilities and finally (3) providing the support you need to thrive socially. For each item, student responses were coded as, 1 = very little, 2 = some, 3 = quite a bit, 4 = very much. The scalelet score was the mean score of the three items. The range of scores were from 1– 4.

Control Variables

A limited number of control variables were also used in this investigation that tapped a number of pre-college and college characteristics known to shape the development of college students and predict student success (Pascarella & Terenzini, 2005). Parents’ education, students’ living arrangements, and year in school were the

control variables used in this investigation. For the two questions that asked the highest level of education of your mother and father, data were ordinal and were coded based on the following responses: 1 = did not finish high school, 2 = graduated from high school, 3 = attended college but did not complete the degree, 4 = completed an associate's degree, 5 = completed a bachelor's degree, 6 = completed a master's degree, or 7 = completed a doctoral degree. Student's living arrangements were identified as one question that asked what best described where you are living while attending college. Data were categorical and were re-coded using a set of dummy variables. These were campus living (1 = dormitory or other campus housing; 0 = other), off-campus living (1 = residence within walking or driving distance of the campus; 0 = other), and Greek living (1 = fraternity or sorority; 0 = other). Year in school were re-coded as 1 = freshman, 2 = senior. For those students who answered "sophomore" (n = 135) to this question were added to the first year student category. For those students who responded "junior" to this question (n = 82) were added to the senior category.

A second set of control variables to better isolate the influence of diversity experiences on a number of student outcomes were incorporated into the models. It is well established in the literature that student-faculty interaction and student's participation in service learning projects can have a positive influence on a number of student outcomes (Umbach & Kuh, 2006; Pascarella & Terenzini, 2005). The control variables of (1) faculty interactions (discussed ideas from your readings or classes with faculty members outside of class) and (2) engaged in a service learning project (participated in a community-based project as part of a regular class) were addressed

according to how students respond to the following NSSE prompt: In your experience at your institution during the current school year, about how often have you done each of the following? For both questions; responses were coded as 1 = never, 2 = sometimes, 3 = often and 4 = very often.

Statistical Analyses

Preliminary Analyses on the Study Sample

From the combined data sets, 2099 student cases were originally identified for the study. However, student cases were immediately eliminated if more than 10% of the data for the variables of interest were missing. Because of this step, 207 student cases were removed. Of the 1892 student cases that remained, missing data from any cell were replaced with the calculated mean for that specific variable. For example, if a student did not respond to the question about coursework in diversity, the mean value for this variable replaced the missing data. Justification for having identical n's for every variable is explained by the model building approach (identified below) to answer the research questions in this investigation.

The NSSE specifically targets first year and senior year students in their survey. However, some students self-reported as sophomores (n = 135), and juniors (n = 82). First year students may have credits accepted from Montana State University due to AP, IB, dual enrollment, and or some college credit (< 30) even though their enrollment at the institution was their first real college experience. Because of this, the researcher collapsed the sophomore ranking with the first year students. Accordingly, the researcher

combined the junior and the senior responses. Senior year students in this investigation were those students who have 90 to 120 credits as of the fall of the academic year in which they took the NSSE survey. However, those students who have only 90 credits may identify as a junior rather than a senior. Finally, 25 students did not classify themselves with any academic rank and were eliminated from the study sample.

The final n for the investigation was 1867. Preliminary analyses on the data were conducted in order to assess the properties and distributions of the data and to determine if assumptions about the data are met in order to analyze using ordinary least squares regression (OLS). Descriptive statistics including frequency counts and frequency distributions, means, and standard deviations for each variable in the investigation were performed. Tests of normality, skewness, and multicollinearity were also performed. General assumptions about the data using OLS techniques are presented later in this chapter.

Multiple Regression Using Ordinary Least Squares and Model Building

Multiple regression correlation (MRC) is a technique that allows researchers to examine the strength, direction, and statistical significance of the association between two variables while controlling for other variables that may confound this association. The two major uses of multiple regression is to determine the predictive power of independent variables (individually and in combination) on a dependent variable (Urdon, 2005) and to describe a relationship between two or more variables and the nature or strength of the relationship (Allison, 1998). MRC is used extensively in a variety of

research disciplines including psychology, sociology, science, education, and medicine (Pohlmann & Leitner, 2003) and is recognized as being both a powerful and flexible data analytic system where a number of different research questions from different research designs can be answered (Cohen, Cohen, West, & Aiken, 2003; Urdon, 2005).

While many mathematical models to identify regression coefficients in MRC are available, ordinary least squares regression (OLS) is the most commonly used method to achieve the smallest sum of squared deviations regression line. OLS is also quite robust to small violations in the assumptions (Cohen et al., 2003; Urdon, 2005). In this investigation, the research question presented was analyzed using OLS. The dependent variables are studied in relationship to or as a function of the independent variables. The analysis provides information about the variance in the DV not only accounted for by a collective set of IVs but also on a potential and unique association of an IV on the DV while other IVs are statistically controlled (Hoyt, Leierer, & Millington, 2006). The resulting regression equation can help to answer a number of different questions. Importantly, in OLS, the dependant variables are assumed to be continuous and on an interval scale. The independent variables can assume a number of measurement levels including interval, ordinal, nominal, and dummy-coded. (Cohen et al.,2003).

In the context of this investigation, OLS was used to model the relationship of the dependent variable(s) (student outcomes) on a collection of independent variables (student demographics, diversity experiences), to provide estimates of the association between student experiences with diversity and self-reported student outcomes.

Additionally, OLS was used to describe and explain any student group differences with diversity experiences on the self-reported student outcomes.

To evaluate the research questions in this investigation, four separate OLS regression analyses were conducted—one for each of the four dependent variables. In each analysis the diversity experiences of the student served as the focal independent variable to test the baseline association between diversity experiences and each of the four self-reported student outcomes. This approach addresses the main research question; namely, (1) what are the relationships between student’s engagement in diversity experiences and student’s self-reported college outcomes? After estimating the baseline relationships further regression equations were structured according the following model building approach:

	Model 1: $Y = \text{diversity experiences}$
Main Effects	Model 2: $Y = \text{Model 1} + \text{student background variables}$
	Model 3: $Y = \text{Model 2} + \text{additional control variables}$
Interaction Effects	Model 4: $Y = \text{Model 3} + \text{interaction terms combining diversity experiences with gender}$
	Model 5: $Y = \text{Model 3} + \text{interaction terms combining diversity experiences with racial group variables}$

Models 1-3 identified below are considered the main effect models where diversity experiences and control variables were analyzed to determine their relationship to each student outcome. Models 4-5 are considered interaction effect models and were used to answer the research questions: (1) to what extent do the relationships between diversity

experiences and self-reported college student outcomes vary between females and males? And (2) to what extent do the relationships between diversity experiences and self-reported college student outcomes vary across the three racial categories

In Model 1, each DV identified was regressed on each diversity experience (coursework, interactional and climate). In Model 2, each DV was regressed on Model 1 plus student background variables. In Model 3, the DV was regressed on Model 2 plus the additional control variables of student-faculty interaction and student participation in a service learning project. To measure the interactions of gender (Model 4 and race and ethnicity (Model 5), each DV was regressed on the interacting term plus Model 3 variables. These models estimated how the diversity experiences of specific groups of students at MSU are differentially associated with their self-reported outcomes. The IBM SPSS 18.0 software package was used for the statistical analyses in this investigation.

Judging the OLS Regression Equations

In a simple regression equation, the b coefficient (slope of the line) and shared intercept create the regression equation. The b-coefficient provides information on the direction and the magnitude of the relation between the IV and DV (Garson, 2009) and the intercept is an estimate of the predicted value of the DV when all IVs are set to the values of zero. As in this investigation, when the regression is extended to include more than one independent variable in trying to explain the dependent variable, a partial regression coefficient (b) is reported for each variable which is the adjusted or net association between the IV and DV once all of the other variables in the regression equation are controlled. Their absolute magnitudes reflect their importance in predicting

the dependent variable (Garson, 2009). Given the model-building strategy it was important to track the size and significance of the focal IVs across the regression models to estimate how much of the baseline associations are explained by the background and control variables.

In addition to the regression equation, the fit statistic R-squared (R^2), which is a statistic that evaluates how good the regression line predicts the outcome variable is presented (Grim & Yarnold, 2005). R^2 is called the multiple coefficient of determination, ranges from 0.0 to 1.0, and is defined as the percent of the variance in the dependent explained uniquely or jointly by the weighted combination of the independent variables (Grim, & Yarnold, 1995). As different IVs are entered into the equation, the R^2 change was evaluated to determine which IV or combination of IVs has the strongest influence on the DV.

The interaction terms including gender and race and ethnicity was added to the model to incorporate the joint effect of gender (or race and ethnicity) and the diversity measures over and above their separate direct effects. The interaction term was entered into regression equation as a pre-calculated crossproduct of the joint variables (Garson, 2009). The regression was run with and without the interaction terms and the significance levels and changes in R^2 determined whether the addition of the interaction terms contribute meaningful and statistical information to the associations between diversity experiences and self-reported student outcomes..

OLS Assumptions

OLS regression models can be used descriptively to establish relationships between variables. However, because inferences are statistically drawn from a sample population, the researcher must make certain assumptions about sampling distributions since it is not possible to make inferences about population parameters. A set of assumptions using OLS must be met in order for the regression model to be meaningful, informative, and to produce unbiased estimates of the regression coefficients and standard errors. (Cohen, 2003). The researcher must properly identify the form of the relationship between the DVs and the IVs. Most researchers, according to Cohen (2003), assume initially the relationship between the DV and IVs are linear. Special terms can be built into the regression model if in fact the relationship between the DV and IVs were nonlinear. OLS models assume that errors terms are uncorrelated implying that observations are independent. Each independent variable is assumed to be measured without errors. That is, the reliability (coefficients) of measurements must be high. Accordingly, OLS assumes the measures of the DV and IV are valid and no outliers are present. Independent variables should be correlated with each other, but not overly correlated (multicollinearity). At each level of the independent variable(s), the variance of the residuals must be constant (homoscedasticity) and finally, residuals in the model are random, and normally distributed. OLS is a robust statistical technique that still produces valid and unbiased results for small violations of these assumptions. Large violations, however, lead to biases in the estimates of the regression coefficients and standard errors and lead to incorrectly identifying significance and confidence intervals

(Cohen et al., 2003; Field, 2005). In this investigation, no apparent violations in any of these assumptions were observed with this data set.

Finally, the researcher assumed that the dependent variables used in this investigation are substantively different variables from each other although categorized under the umbrella of “self-reported student outcomes.” That is, each of the four self-reported student outcomes measured different student outcomes. A correlations matrix was created to determine if any DV was associated with another DV used in the investigation (Table 3.3). No two variables were highly correlated with each other. Finally, because of the nature of this investigation where multiple comparisons will be made, the research used a Bonferroni correction to minimize the chance of making a Type 1 error. The alpha level used in this investigation was adjusted for the number of DV (4) analyzed. The statistical threshold was set at .0125 (i.e., .05/4).

Table 3.3 Correlation Matrix of the Dependent Variables

Variables	Educational Gains	Personal Social Gains	Institutional Satisfaction	Supportive Campus Environment
Educational Gains	1	.594	.458	.416
Personal Social Gains	.594	1	.399	.562.
Institutional Satisfaction	.458	.399	1	.436
Supportive Campus Environment	.416	.562	.436	1

Chapter Summary

The methodology used in this investigation was presented in this chapter. Descriptions of the research design, sampling method, the sample population, the independent and dependent variables, the statistical approach and analyses were also identified. The following chapter discusses the results of the investigation.

CHAPTER 4

RESULTS OF THE STUDY

Introduction

This chapter includes the results from the data analyses from this quantitative investigation. The first section presents general descriptive analyses of the study sample. The subsequent sections present findings from how each dependent variable regressed on the focal independent variables. The main sections in this chapter are titled: (1) descriptive analyses of the study sample; (2) general educational gains on diversity experiences; (3) personal and social gains on diversity experiences; (4) institutional satisfaction on diversity experiences; and (5) supportive campus environment on diversity experiences. The final section provides an overall summary of the results from this investigation.

Descriptive Analyses of the Study Sample

Table 4.1 presents description and summary statistics of the study sample (n = 1867) by race and ethnicity. Data indicate that most students who answered the NSSE in this study were White (86%) and female (54%). Native American and Asian students each represented 2% of the study sample while Hispanic students comprised 1%. Students who reported “other” for ethnicity made up 3% of the study sample and those

Table 4.1 Descriptive Statistics by Race and Ethnicity

Variable	Race and Ethnicity							Total %
	Total	<i>Native American</i>	<i>Asian</i>	<i>White</i>	<i>Hispanic</i>	<i>Other</i>	<i>Prefer not to respond</i>	
Study Sample N	1867	39 (2%)*	42 (2%)*	1604 (86%)*	24 (1%)*	51 (3%)*	107 (6%)*	100%
Gender								
Female	1000	17	22	870	15	26	50	54%
Male	867	22	20	734	9	25	57	46%
Academic Rank								
Freshman	883	22	21	767	9	21	43	47%
Senior	984	17	21	837	15	30	64	53%
Diversity Experiences								
	Range	Mean			Sample Mean (SD)			
Coursework	1-4 ^a	2.82	2.60	2.63	2.63	2.98	2.76	2.65 (0.87)
Interactional	1-4 ^a	2.72	2.30	2.38	3.12	3.00	2.59	2.42 (0.82)
Climate	1-4 ^b	2.23	2.10	2.18	2.25	2.25	1.99	2.17 (0.92)
Student Outcomes								
Gen. Education Gains	1-4 ^b	2.91	2.88	2.96	3.22	2.88	2.85	2.96 (0.65)
Personal/Social Gains	1-4 ^b	2.30	2.38	2.67	2.34	2.09	2.27	2.27 (0.67)
Supportive Campus Environment	1-4 ^b	2.27	2.33	2.25	2.24	2.19	2.05	2.24 (0.67)
Institutional Satisfaction	1-4 [#]	3.21	2.95	3.14	3.08	3.09	2.96	3.12 (0.67)

Table 4.1 Descriptive Statistics by Race and Ethnicity

Variable	Range	Race and Ethnicity					Prefer not to respond	Sample Mean (SD)
		Native American	Asian	White	Hispanic	Other		
Living Arrangements	1-3 ^c	51%	45%	40%	25%	35%	36%	1.61 (0.51)
Father's Education	1-7 ^d	3.54	4.52	4.07	3.96	4.08	4.32	4.08 (1.70)
Mother's Education	1-7 ^d	3.56	3.55	4.03	4.25	3.98	4.28	4.03 (1.50)
Community Project	1-4 ^a	1.69	1.50	1.54	1.67	1.98	1.46	1.55 (0.78)
Discussion with Faculty	1-4 ^a	2.05	2.02	1.88	2.33	2.31	1.87	1.90 (0.85)

∞

a response set (1 = Never, 2 = Sometimes, 3 = Often, 4 = Very Often)

b response set (1 = Very little, 2 = Some, 3 = Quite a Bit, 4 = Very Much)

c % of students living in a dormitory

d response set range (1 = did not finish high school, 2 = graduated from H.S., 3. Attended some college, 4 = completed an associate's degree, 5 = completed a bachelor's degree, 6 = completed a master's degree, 7 = completed a Ph.D.)

* Percents rounded to whole numbers

responses are a composite of 2 different response sets-these scores are presented later in the chapter as z-scores

students who “preferred not to respond” when asked about their ethnicity made up 6% of the sample. Seniors represented 53% of the study sample and freshman represented 47%.

The summary statistics for the measures (means and standard deviations) of the diversity experiences, student outcomes and control variables by race and ethnicity are also presented in Table 4.1. To determine if group means were different in their reported diversity experiences and educational outcomes, one-way analysis of variances (ANOVA) were conducted on each of the variables of interest. When comparing the mean differences among the six racial and ethnic categories with either coursework or climate for diversity, no significant results were reported. This suggests that these types of diversity experiences were fairly uniform throughout the university regardless of race. However, the overall ANOVA for race and ethnicity with interactional diversity was significant $F(5, 1861) = 11.895, p = .000$. This result suggests that this type of activity “the likely-hood of talking with someone of a different race or ethnicity or having serious conversations with students who are different from them” was not uniform across the different racial and ethnic groups on campus. Tamhane post-hoc tests were run to evaluate the differences among the means with results revealing the following significant group differences; Asians and Hispanics; Asians and Other; White and Hispanics; and White and Other (Table 4.2).

ANOVA’s were also conducted to evaluate the relationship of the different racial and ethnic groups on the four dependent variables used in the investigation (educational gains, personal and social gains, institutional satisfaction and supportive campus environment). No significant differences between racial groups were detected with three

of the four student outcomes. However, for the dependent variable, personal and social gains, the overall ANOVA was significant $F(5, 1861) = 3.730, p = .002$.

Table 4.2 SPSS Results of Tamhane Post-Hoc Tests with Interactional Diversity.

Racial Categories	Racial Categories	Mean Difference	Std. Error
Asian	Hispanic	-.815*	.225
	Other	-.700*	.191
White	Hispanics	-.740*	.167
	Other	-.625*	.115

*($p < .05$)

This result suggests that this type of student outcome was not uniform across the different races. Tamhane post-hoc tests revealed that group differences existed between Hispanic and PNR groups ($t = .581, SE = .162, p < .05$).

Data from Table 4.1 also present other general student characteristics about the study sample based on means scores. Data suggest that most students in this investigation live in either a dormitory or off campus housing and both parents (mother and father) have either attended some college or earned at least an associate's degree. The study sample means for participated in a community project and having discussions with faculty outside of the classroom suggests that as group, these students fall somewhere between "never" to "sometimes" when answering these NSSE questions.

Analyses

Multiple regression analyses were performed using the 2007 and 2008 NSSE data to answer the primary research question: what are the relationships between student's engagement in diversity experiences and student's self-reported college outcomes? Multiple regression analyses were also performed to answer the following interaction research questions: (a) to what extent do the relationships between diversity experiences and self-reported college student outcomes vary between females and males? And, (b) to what extent do the relationships between diversity experiences and self-reported college student outcomes vary between different races and ethnicities? Ordinary least squares regression (OLS) was used to achieve the smallest sum of squared deviations regression lines. Prior to regression analyses a correlation matrix was created to determine the zero order correlations among all pairs of predictor variables used in the investigation (Appendix C). The literature reports that correlations coefficients of .10, .30 and .60 (regardless of sign) correspond to low, medium and high correlations where high bivariate correlations among predictor variables may suggest the presence of multicollinearity (Neter, Kutner, Wasserman, & Nachtsheim, 1996). In this investigation, no high bivariate correlations among predictor variables were reported (-.001 to .59) suggesting that multicollinearity may not be present in the analyses. To confirm this, tests for multicollinearity on the predictor variables were determined. All tolerances and variance inflation factors as stated in the guidelines from Field (2005), suggested no collinearity in the data (data not shown). To justify the use of the OLS method and to rule out the use of a MANOVA for statistical analysis, a correlation matrix

was also created on the dependent variables to determine any significant relationships existed (Table 3.3). No high bivariate correlations were reported (.39 to .59) among the four dependent variables used in the investigation thus no overlap in the conceptual meaning of each dependent variable was apparent.

As detailed specifically in Chapter 3, after estimating the baseline effect of each diversity experience on a student outcome, a model building approach was adopted where blocks of control variables were added sequentially to additional regression models. The model-building steps followed the general structure:

	Model 1: $Y = \text{diversity experiences}$
Main Effects	Model 2: $Y = \text{Model 1} + \text{student background variables}$
	Model 3: $Y = \text{Model 2} + \text{additional control variables}$
Interaction Effects	Model 4: $Y = \text{Model 3} + \text{interaction terms combining diversity experiences with gender}$
	Model 5: $Y = \text{Model 3} + \text{interaction terms combining diversity experiences with racial group variables}$

The following sections present the results from the regression of the dependant variables on the three focal independent variables (diversity experiences). The first section describes the analyses of students' educational gains on coursework, interactional and climate for diversity experiences.

Students' Educational Gains and Diversity Experiences

This section describes in detail the results from the regression analyses of educational gains on diversity experiences. A summary of the regression of educational gains on coursework diversity is presented first, followed by the results from the regression analyses of educational gains on interactional diversity and climate for diversity respectively.

Educational Gains on Coursework Diversity

The results for the main effects regression of student educational gains on coursework diversity and selected background and control variables are presented in Table 4.3. A quick look across the first three regression models showed that coursework diversity was a positive and statistically significant predictor of student educational gains, even in the presence of a wide range of control variables. The baseline estimate of coursework diversity in Model 1 revealed an unstandardized coefficient of about .20 ($p < .001$), suggesting that a one-unit increase in coursework diversity (e.g., moving from “sometimes” to “often”) is associated with a .20 increase in a student’s educational gain. By itself, an R-square value of .073 indicates that individual differences in coursework diversity explained 7.3% of the individual differences in educational gains.

In Model 2, control variables for race and academic rank were entered into the regression equation, but these variables do not appear to account fully for the earlier influence of coursework diversity. Indeed, the coefficient for coursework diversity retained both its coefficient size (.21) and level of statistical significance ($p < .001$). Two

Table 4.3 Unstandardized OLS Regression Coefficients for Educational Gains on Coursework Diversity

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
	b(SE)	b(SE)	b(SE)	b(SE)	b(SE)
Coursework Diversity	.197(.016)***	.207(.016)***	.172(.017)***	.180(.023)***	.166(.018)***
Gender (1 = Female)		-.008(.029)	-.022(.029)	-.022(.089)	-.021(.029)
Race					
White (reference)					
Native American		-.074(.100)	-.108(.098)	-.106(.099)	-.145(.383)
Asian		-.073(.096)	-.099(.095)	-.100(.095)	-.322(.270)
Hispanic		.239(.127)	.177(.125)	.175(.125)	.371(.341)
Other		-.164(.088)	-.228(.087)**	-.228(.087)**	-.378(.281)
Prefer Not to Respond		-.156(.062)*	-.137(.061)*	-.138(.061)*	-.284(.190)
Academic Rank (1=F,2=S)		.146(.029)***	.093(.036)**	.092(.036)**	.090(.036)*
Living Arrangements					
Dormitory (reference)					
Off Campus			.022 (.036)	.021(.036)	.024(.037)
Fraternity			.041 (.135)	.039(.135)	.045(.135)
Father's Education			-.003(.010)	-.003(.010)	-.003(.010)
Mother's Education			-.018(.011)	-.018(.011)	-.018(.011)
Community Project			.042(.019)*	.041(.019)*	.042(.019)*
Discussion with Faculty			.137(.019)***	.137(.018)***	.137(.018)***
Interaction Effects					
Gender				-.016(.032)	
Native American					.014(.131)
Asian					.086(.097)
Hispanic					-.074(.121)
Other					.051(.090)
Prefer Not to Respond					.054(.066)
Constant	2.44(0.45)***	2.20(.068)***	2.13(.081)***	2.11(.090)***	2.15(.083)***
R	.270***	.303***	.360***	.360***	.362***
R-Squared	.073	.092	.130	.130	.131
Adj. R-Squared	.072	.088	.123	.123	.122
% Change in R-Square		26	41	0	0.7
df	1	8	14	15	19

* p <.05; ** p < .01; ***p <.001

of these control variables reached statistical significance: (a) compared to White students, those who preferred not to state their race had lower levels of educational gains, and (b) seniors reported higher educational gains than did their freshman counterparts. As a result, the addition of these control variables did increase the R-square by 26% from .073 in Model 1 to .092 in Model 2.

An additional block of control variables were entered into Model 3. These variables tapped living arrangements, parental education, and academic activities outside of the classroom. As in Model 2, the association between coursework diversity and educational gains remained positive and statistically significant. However, the coefficient for coursework diversity decreased slightly to .17, which represents a 17% decrease in size from the coefficient of .21 seen in Model 2. Yet, the coefficient for coursework diversity in Model 3 still retained its significant level at $p < .001$. Among this block of control variables, both academic activities emerged as significant predictors of educational gains. Indeed, students who were more likely to be involved in community-based projects and have more discussions about academics with faculty outside of the classroom were also more likely to report higher educational gains. The largest effect size as measured by the R-square value was observed in Model 3. As a group, all of the variables in Model 3 explained 13% of individual differences in education gains, which represents a 41% increase in explained variance from Model 2.

Also investigated were a series of interaction terms, the first of which are reported in Model 4. In this model, a gender x coursework diversity interaction term was added to the regression equation represented by Model 3. This term did not reach statistical

significance, suggesting that the positive association between coursework diversity and educational gains did not differ between females and males. In Model 5, a series of interaction terms crossing racial categories with coursework diversity were added to the regression equation represented by Model 3. As with gender, none of these terms reached statistical significance indicating that the positive association between coursework diversity and educational gains did not differ across racial categories. The lack of interaction effects are also revealed in the R-square values for the two models, which do not differ from the R-square value of .130 seen in Model 3. The following section presents the results from educational gains and interactional diversity.

Educational Gains on Interactional Diversity

The results for the main effects regression of student educational gains on interactional diversity and selected background and control variables are presented in Table 4.4. The first three regression models showed that interactional diversity was a positive and statistically significant predictor of student educational gains and remained statistically significant after the addition of several control variables. The baseline estimate of interactional diversity (Model 1) revealed an unstandardized coefficient of about .180 ($p < .001$). This results means that a one-unit increase in interactional diversity (e.g., moving from “sometimes” to “often”) is associated with a .18 increase in educational gains. In Model 1, the R-square value of .051 indicated that individual differences in interactional diversity explained 5.1% of the individual differences in educational gains.

In Model 2, when the control variables for race and academic rank were entered into the regression equation, the coefficient for interactional diversity increased to .18 and remained statistically significant ($p < .001$). In this block, four control variables reached statistical significance: (a) compared to males, females had lower educational gains (b) compared to White students, those who selected “other” and (c) preferred not to respond (PNR) when asked about their race or ethnicity had lower levels of educational gains, and finally, (d) seniors reported higher educational gains than the freshman cohort in the investigation. The addition of these control variables increased the effect size R-square by 31% from .051 in Model 1 to .067 in Model 2. When the variables, living arrangements, parental education, and academic activities outside of the classroom were added to the regression equation (Model 3), these variables explained a modest amount of the influence of interactional diversity. Although the coefficient for interactional diversity declined by 26%, from .18 (Model 2) to about .14 (Model 3), the coefficient for interactional diversity retained its significance ($p < .001$). The three control variables that were statistically significant in Model 2 remained statistically significant in Model 3 (gender, other, and PNR), however, academic rank no longer remained a significant predictor of educational gains. The academic activities outside of the classroom (community projects and contact with faculty) were also significant predictors of educational gains. Again suggesting that students who were more likely to be involved in community-based projects and have more discussions about academics with faculty outside of the classroom were also more likely to report higher educational gains. Model 3 returned the largest effect size as measured by the R-square value. As a group, all of

Table 4.4 Unstandardized OLS Regression Coefficients of Students' Educational Gains on Interactional Diversity

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
	b(SE)	b(SE)	b(SE)	b(SE)	b(SE)
Interactional Diversity	0.179(.018)***	0.184(.018)***	0.136(.019)***	.117(.025)***	0.127(.020)***
Gender (1 = Female)		-.059(.029)*	-.062(.029)*	-.165(.089)	-.062(.029)*
Race					
White (reference)					
Native American		-.092(.102)	-.120(.100)	-.123(.100)	-.139(.105)
Asian		-.065(.098)	-.089(.096)	-.092(.096)	-.105(.097)
Hispanic		.102(.129)	.072(.127)	.073(.127)	-.079(.167)
Other		-.202(.090)*	-.254(.088)**	-.255(.088)**	-.289(.107)**
Prefer Not to Respond		-.161(.063)**	-.137(.062)*	-.137(.062)*	-.153(.062)*
Academic Rank (1=F,2=S)		.116(.029)***	.062(.036)	.062(.036)	.066(.036)
Living Arrangements					
Dormitory (reference)					
Off campus			.029(.037)	.027(.037)	.026(.037)
Fraternity			.004(.137)	.009(.137)	.004(.137)
Father's Education			-.008(.010)	-.008(.010)	-.008(.010)
Mother's Education			-.015(.010)	-.014(.011)	-.015(.011)
Community Project			.058(.019)**	.059(.019)**	.058(.019)**
Discussion with Faculty			.133(.018)***	.132(.018)***	.133(.018)***
Interaction Effects					
Gender				.042(.035)	
Native American					.066(.107)
Asian					-.117(.091)
Hispanic					.131(.147)
Other					.065(.101)
Prefer Not to Respond					.102(.063)
Constant	2.52(0.46)***	2.38(.065)***	2.31(.078)***	2.36(.088)***	2.33(.081)***
R	.226***	.260***	.326***	.327***	.330***
R-Squared	.051	.067	.106	.107	.109
Adj. R-Squared	.051	.063	.099	.099	.100
% change in R-Square		31	58	0.9	2.8
df	1	8	14	15	19

* p < .05, ** p < .01, ***p < .001

the variables in Model 3 explained 10.6% of individual differences in educational gains, which represented a 58% increase in explained variance from Model 2.

In Model 4, the interaction term of gender x interactional diversity was added to the regression equation from Model 3. This term did not reach statistical significance, suggesting that the positive association between interactional diversity and educational gains did not differ between females and males. In Model 5, a series of interaction terms crossing racial categories with interactional diversity were added to the regression equation represented by Model 3. None of the variables entered in the regression equation reached statistical significance indicating that the positive association between interactional diversity and educational gains did not differ across racial categories. The R-square values (.099, Model 4 and .100, Model 5) which do not differ from the R-square value reported in Model 3 (.099) offer further support to the lack on any interaction effects. The following section presents the results from educational gains and climate for diversity experience.

Educational Gains on Climate for Diversity

Table 4.5 presents the results for the main effects regression of student educational gains on climate for diversity and selected background and control variables. As with the previous regression analyses of coursework and interactional diversity, climate for diversity was also a positive and statistically significant predictor of educational gains across the first three regression analyses and in the presence of a number of control variables. Model 1 revealed the baseline estimate for climate for diversity. The unstandardized coefficient of about .21 ($p < .001$), suggests that a one-unit

Table 4.5 Unstandardized OLS Regression Coefficients of Student's Educational Gains on Climate for Diversity

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
	b(SE)	b(SE)	b(SE)	b(SE)	b(SE)
Climate for Diversity	.211(.016)***	.228(.016)***	.196(.016)***	.218(.025)***	.187(.017)***
Gender (1 = Female)		-.300(.028)	-.038(.028)	.070(.072)	-.040(.028)
Race					
White (reference)					
Native American		-.039(.099)	-.072(.097)	-.069(.097)	-.257(.269)
Asian		-.059(.095)	-.081(.094)	-.074(.094)	-.014(.252)
Hispanic		.216(.125)	.152(.123)	.158(.123)	.056(.377)
Other		-.111(.87)	-.182(.086)*	-.173(.086)*	-.255(.207)
Prefer Not to Respond		-.088(.061)	-.082(.060)	-.080(.060)	-.313(.148)*
Academic Rank		.192(.029)***	.113(.035)**	.111(.035)**	.110(.036)**
Living Arrangements					
Dormitory (reference)					
Off campus			.059(.036)	.066(.036)	.062(.034)
Fraternity			.028(.134)	.024(.134)	.030(.134)
Father's Education			-.001(.010)	-.001(.010)	-.002(.010)
Mother's Education			-.010(.011)	-.010(.011)	-.009(.011)
Community Project			.053(.019)**	.054(.019)**	.053(.019)**
Discussion with Faculty			.122(.018)***	.121(.018)***	.121(.018)***
Interaction Effects					
Gender				-.050(.031)	
Native American					.083(.113)
Asian					-.032(.111)
Hispanic					.045(.158)
Other					.033(.084)
Prefer Not to Respond					.115(.068)
Constant	2.50(0.37)***	2.18(.064)***	2.08(.079)***	2.03(.085)***	2.33(.081)***
R	.299***	.338***	.385***	.386***	.387***
R-Squared	.089	.115	.148	.149	.150
Adj. R-Squared	.089	.111	.142	.142	.141
% change in R-Square		29	28.7	0.6	1.3
df	1	8	14	15	19

* p < .05; ** p < .01; ***p < .001

increase in climate for diversity (e.g., moving from “some” to “quite a bit”) is associated with a .21 increase in a student’s educational gain. The individual differences in climate for diversity explained 8.9% of the individual differences in educational gains (R-squared = .089).

When race and academic rank controls were entered into the regression equation as identified in Model 2, the coefficient for climate for diversity increased slightly from .21 (Model 1) to about .23 (Model 2) and remained statistically significant ($p < .001$). One control variable, academic rank reached statistical significance: when compared to freshmen, seniors were more likely to report higher educational gains. However, the addition of the variables related to academic rank and race increased the R-square by 29% (.089 in Model 1 to about .115 in Model 2). When living arrangements, parental education, and academic activities outside of the classroom were introduced to the regression equation as identified in Model 3, the association between climate for diversity and educational gains remained positive and statistically significant although the coefficient for climate for diversity decreased slightly to about .20 ($p < .001$). This represented a 14% decrease in size of the coefficient from about .23 seen in Model 2. Four other variables in this Model 3 were identified as significant predictors of educational gains: (a) compared to White, those who identified with the racial category “other” were likely to report lower educational gains, and (b) seniors were likely to report higher education gains than freshman. Both academic activities outside of the classroom were also significant predictors of educational gains. The largest effect size as measured by the R-square value was reported in Model 3 (.148). As a group, all of the variables in

Table 4.6 OLS Regression Coefficients of Students' Educational Gains on Diversity Experiences

Variables	Unstandardized Coefficients	Standardized Coefficients
	b(SE)	Beta
Coursework Diversity	.124(.017) ^{***}	.170
Interactional Diversity	.166(.016) ^{***}	.235
Climate for Diversity	.063 (.019) ^{***}	.080
Gender (1 = female)	-.006 (.028)	-.004
Race		
White(reference)		
Native American	-.110(.035) ^{***}	.102
Asian	-.072(.095)	-.024
Hispanic	.131(.092)	-.017
Other	-.240(.121)	.023
Prefer Not to Respond	-.122(.084) ^{**}	-.061
Academic Rank	-.003(.059)	-.044
Living Arrangements		
Dormitory (reference)		
Off campus	.062(.009)	-.007
Fraternity	.026(.011)	-.030
Father's Education	.062(.019)	.031
Mother's Education	.026(.018) ^{***}	.117
Community Project	.124(.035)	.047
Discussion with Faculty	.166(.131)	.004
Constant	1.747(.086) ^{***}	
R	.431	
R-Squared	.186	
Adj. R-Squared	.178	
Df	16	

* p < .05; ** p < .01; ***p < .001

Model 3 explained 14.8 % of individual differences in education gains, which represented about a 29% increase in the explained variance from Model 2.

When the interaction terms included for gender (Model 4) and race and ethnicity (Model 5) were entered into the regression equation from Model 3, none of the interaction terms reached statistical significance suggesting that the positive association between climate for diversity did not differ between females and males or across racial or ethnic groups. The lack of any interaction effect was also observed in the similar R-squared values in Models 3, 4 and 5 (.142, .142 and .141 respectively).

Educational Gains on All Three Diversity Experiences

To further tease out the influence of the three focal independent variables, all three diversity experiences were simultaneously entered into the regression equation of the full model (Table 4.6). This strategy helped to identify if one diversity experience over another had a stronger impact or influence on student's educational gains. Data in Table 4.6 reveal that all three diversity experiences were significant predictors of educational gains ($p < .001$) with reported unstandardized coefficients of .124, .166 and .063 for coursework, interactional and climate for diversity respectively. When these values were compared to their respective Model 3 coefficients (Tables 4.3, 4.4, and 4.5) both coursework and climate for diversity coefficients decreased from .172 to .124 (coursework) and from .196 to .063 (climate). The unstandardized coefficient for climate for diversity increased from .136 (Model 3, Table 4.4) to .166 (Table 4.6).

The standardized beta coefficients of the variables are also presented in Table 4.6. Standardized coefficients are presented in units of standard deviations, thus, allowing

comparisons among predictor variables to be determined. The higher the beta value, the greater the relative impact it has on the dependent variable net of the influence of the other predictor variables. Data in Table 4.6 clearly indicate that interactional diversity followed by coursework and then climate for diversity had the higher beta value for educational gains ($\beta = .235, .170$, and $.063$ respectively, $p < .000$). These results indicate that interactional diversity has a greater relative impact on student's educational gains followed by coursework and then climate for diversity.

Other variables that were significant predictors of educational gains included: Native Americans and individuals who preferred not to respond about their race had lower educational gains than when compared to Whites. Seniors had higher educational gains than freshman and student's whose mothers reported to have some postsecondary education had higher levels of educational gains than student's whose mothers who did not. The proportion of variance accounted for in educational gains by all the predictor variables was 18.6%. The next section discusses the student outcome, personal and social gains and diversity experiences.

Students' Personal and Social Gains on Diversity Experiences

This section describes in detail the results from the regression analyses of personal and social gains on diversity experiences. A summary of the regression of personal and social gains on coursework diversity is presented first, followed by the results from the regression analyses of personal and social gains on interactional diversity and climate for diversity respectively.

Personal and Social Gains on Coursework Diversity

The results for the main effects regression of students' personal and social gains on coursework diversity and selected background and control variables are presented in Table 4.7. Across the first three main effect regression models in Table 4.7, coursework diversity was a positive and statistically significant predictor of a student's personal and social gains, even in the presence of a wide range of control variables. The baseline estimate of coursework diversity in Model 1 revealed an unstandardized coefficient of about .23 ($p < .001$). This finding suggests that a one-unit increase in coursework diversity (e.g., moving from "sometimes" to "often") is associated with about a .23 increase in students' personal and social gains. By itself, an R-square value of .093 indicates that individual differences in coursework diversity explained 9.3% of the individual differences in personal and social gains. In Model 2, control variables for race and academic rank were entered into the regression equation. The coefficient for coursework diversity decreased slightly (.23) but retained the level of statistical significance ($p < .001$). Three control variables reached statistical significance: (a) compared to White students, Hispanic students reported higher personal and social gains but those who prefer not to state their race had lower levels of personal and social gains, and (b) seniors reported lower personal and social gains than did their freshman counterparts ($p < .05$). The addition of this set of control variables increased the R-square by 15% from .093 in Model 1 to .107 in Model 2. The control variables that tapped into living arrangements, parental education, and academic activities outside of the classroom were entered in Model 3. As in Model 2, the association between

Table 4.6 OLS Regression of Students' Personal and Social Gains on Coursework Diversity

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
	b(SE)	b(SE)	b(SE)	b(SE)	b(SE)
Coursework Diversity	0.231(.017)***	0.227(.017)***	0.162(.017)***	.180(.023)***	0.160(.018)***
Gender (1 = Female)		-.068(.03)	-.078(.029)**	.025(.078)	-.078(.029)**
Race					
White (reference)					
Native American		-.011(.103)	-.061(.098)	-.056(.098)	-.227(.380)
Asian		.119(.099)	.089(.094)	.086(.094)	.008(.269)
Hispanic		.389(.131)**	.309(.124)**	.304(.124)*	.264(.339)
Other		-.003(.091)	-.123(.086)	-.122(.086)	.047(.280)
Prefer Not to Respond		-.212(.064)**	-.180(.060)**	-.183(.060)**	-.236(.189)
Academic Rank		.069(.028)*	-.029(.036)	-.029(.036)	-.029(.030)
Living Arrangements					
Dormitory (reference)					
Off campus			-.091(.036)*	-.092(.036)*	-.090(.036)*
Fraternity			.119(.134)	.115(.134)	.118(.134)
Father's Education			.007(.010)	.007(.010)	.007(.010)
Mother's Education			-.008(.011)	-.008(.011)	-.008(.011)
Community Project			.158(.019)***	.157(.019)***	.157(.019)***
Discussion with Faculty			.176(.017)***	.177(.017)***	.176(.018)***
Interaction Effects					
Gender				-.039(.032)	
Native American					.059(.131)
Asian					.031(.097)
Hispanic					.017(.120)
Other					-.057(.090)
Prefer Not to Respond					.021(.065)
Constant	1.66(.047)***	1.72(.070)***	1.41(.080)***	1.36(.090)***	1.41(.083)***
R	.305***	.327***	.450***	.450***	.450***
R-Squared	.093	.107	.202	.203	.202
Adj. R-Squared	.093	.103	.196	.196	.194
% change in R-Square		15	89	.4	0
df	1	8	14	15	19

* p < .05; ** p < .01; *** p < .001

coursework diversity and personal and social gains remained positive and statistically significant. However, the coefficient for coursework diversity decreased further to about .16, representing a 28% decrease in size as seen in Model 2. The coefficient for coursework diversity in Model 3 retained its significant level at $p < .001$. With this block of control variables, the race categories of Hispanic and PNR retained their statistical significance ($p < .01$) and academic activities outside of the classroom and students living off campus also emerged as significant predictors of personal and social gains. The largest effect size as measured by the R-square value was observed in Model 3. As a group, all of the variables in Model 3 ($R\text{-squared} = .20$) explained about 20% of individual differences in personal and social gains. The increase in R-squared from Model 2 represented about an 89% increase in the explained variance.

Also investigated were a series of interaction terms, the first of which are reported in Model 4. In this model, a gender x coursework diversity interaction term was added to the regression equation represented by Model 3. This term did not reach statistical significance, suggesting that the positive association between coursework diversity and personal and social gains did not differ between females and males. In Model 5, a series of interaction terms crossing racial categories with coursework diversity were added to the regression equation represented by Model 3. As with gender, none of these terms reached statistical significance indicating that the positive association between coursework diversity and personal and social gains did not differ across racial categories. The following section presents the results from personal and social gains and interactional diversity.

Personal and Social Gains on Interactional Diversity

The results for the main effects regression of student personal and social gains on interactional diversity and selected background and control variables are presented in Table 4.8. Interactional diversity was a positive and statistically significant predictor of student personal and social gains, even in the presence of a wide range of control variables. The baseline estimate of interactional diversity in Model 1 revealed an unstandardized coefficient of about .23 ($p < .001$), suggesting that a one-unit increase in interactional diversity (e.g., moving from “sometimes” to “often”) is associated with a .23 increase in students’ personal and social gains. The R-square value of .086 indicates that individual differences in interactional diversity explained 8.6% of the individual differences in students’ personal and social gains

In Model 2, control variables for race and academic rank were entered into the regression equation. The coefficient for interactional diversity increased slightly to (.24) and the level of statistical significance ($p < .001$) was retained. Two additional variables in Model 2 reached statistical significance: (a) compared to White students, PNR individuals had lower levels of personal and social gains, and (b) females reported lower personal and social gains than their male counterparts. It is noted that the addition of these background variables increased the R-square by 22% from .086 in Model 1 to .105 in Model 2. In Model 3, after the addition of more control variables related to living arrangements, parents education, and academic activities outside of the classroom, the association between interactional diversity and personal and social gains remained positive and statistically significant, although the coefficient for interactional diversity

decreased to .161 from .242 in Model 2. This represented a 33% decrease in the coefficient for interactional diversity. The same control variables as identified in Model 2 remained significant in Model 3, however, an additional variable referring to off campus living arrangements (compared to students living in a dormitory) emerged as an additional predictor of personal and social gains.

In Model 4, a gender x interactional diversity interaction term was added to the regression equation represented by Model 3. This term did not reach statistical significance, suggesting that the positive association between interactional diversity and personal and social gains did not differ between females and males. Interestingly, in Model 5, a series of interaction terms crossing racial categories with interactional diversity were added to the regression equation represented by Model 3. One interaction term reached statistical significance, Asian (-.221, $p < .05$). This finding indicates that the positive association between interactional diversity and personal and social gains does differ across racial categories. From the analysis, the association between interactional diversity experiences and personal and social gains is significantly less for Asian students than compared to White students. The following section presents the results from the regression of personal and social gains on climate for diversity.

Personal and Social Gains on Climate for Diversity

Table 4.9 presents the results for the main effects regression of students' personal and social gains on climate for diversity and selected background and control variables. Climate for diversity was a positive and statistically significant predictor of students'

Table 4.8 OLS Regression of Students' Personal and Social Gains on Interactional Diversity

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
	b(SE)	b(SE)	b(SE)	b(SE)	b(SE)
Interactional Diversity	0.231(.017)***	0.242(.017)***	0.161(.018)***	.140(.024)***	0.175(.020)***
Gender (Female = 1)		-.122(.03)***	-.114(.028)**	-.227(.088)*	-.112(.028)***
Race					
White (reference)					
Native American		-.044(.103)	-.082(.098)	-.085(.098)	-.102(.103)
Asian		.130(.079)	.102(.095)	.099(.095)	.073(.085)
Hispanic		.209(.131)	.190(.125)	.191(.125)	.187(.165)
Other		-.070(.091)	-.162(.089)	-.164(.087)	-.165(.106)
Prefer Not to Respond		-.226(.064)***	-.187(.061)**	-.188(.061)**	-.174(.061)**
Academic Rank		-.044(.030)	-.057(.036)	-.057(.036)	-.053(.036)
Living Arrangements					
Dormitory					
Off campus			-.081(.036)*	-.084(.036)*	-.084(.036)
Fraternity			.079(.135)	.085(.135)	.075(.135)
Father's Education			.002(.010)	.001(.010)	.002(.010)
Mother's Education			-.005(.011)	-.004(.011)	-.005(.011)
Community Project			.169(.019)***	.163(.018)***	.169(.019)***
Discussion with Faculty			.163(.018)***	.170(.019)***	.165(.018)***
Interaction Effects					
Gender				.047(.034)	
Native American					.048(.105)
Asian					-.221(.090)*
Hispanic					-.011(.145)
Other					-.012(.099)
Prefer Not to Respond					-.087(.062)
Constant	1.69(.046)***	1.81(.066)***	1.52(.077)***	1.57(.086)***	1.48(.079)***
R	.294***	.325***	.442***	.443***	.446***
R-Squared	.086	.105	.195	.196	.199
Adj. R-Squared	.086	.102	.189	.189	.190
% change in R-Square		22	85.7	.5	2
df	1	8	14	15	19

* p < .05; ** p < .01; ***p < .001

personal and social gains across the main effects regression models. The baseline estimate of climate for diversity in Model 1 revealed an unstandardized coefficient of about .33 ($p < .001$), suggesting that a one-unit increase in climate for diversity (e.g., moving from “some” to “quite a bit”) is associated with a .33 increase in students personal and social gains. By itself, an R-square value of about .21 indicates that individual differences in coursework diversity explained about 21% of the individual differences in educational gains.

In Model 2, control variables for race and academic rank were entered into the regression equation, the coefficient for climate for diversity retained both its coefficient size (.33) and level of statistical significance ($p < .001$). Four variables reached statistical significance: (a) compared to males, females had lower personal and social gains, (b) compared to White students, Hispanics reported higher personal and social gains while (c) PNR students reported lower personal and social gains, and finally (d) seniors reported higher educational compared to their freshman counterparts. The addition of these control variables increased the R-square but by only about 6% from about .21 in Model 1 to .22 in Model 2. An additional block of control variables representing living arrangements, parental education, and academic activities outside of the classroom were entered in Model 3. As observed in Model 2, the association between climate for diversity and personal and social gains remained positive and statistically significant in Model 3. However, the coefficient for climate for diversity decreased about 14% to about .29 in Model 3. Both academic activities outside of the classroom emerged as additional significant predictors of personal and social gains.

Table 4.9 OLS Regression of Students' Personal and Social Gains on Climate for Diversity

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
	b(SE)	b(SE)	b(SE)	b(SE)	b(SE)
Climate for Diversity	0.334(.015)***	0.336(.015)***	0.288(.015)***	.304(.020)***	0.281(.016)***
Gender (1 = Female)		-.077(.028)**	-.077(.027)**	.016(.068)	-.079(.027)**
Race					
White (reference)					
Native American		.024(.096)	-.022(.092)	-.019(.012)	-.022(.254)
Asian		.143(.093)	.119(.089)	.125(.089)	.057(.238)
Hispanic		.356(.122)**	.289(.116)*	.291(.116)*	-.035(.356)
Other		.046(.084)	-.076(.081)	-.068(.081)	-.148(.196)
Prefer Not to Respond		-.124(.059)*	-.116(.057)*	-.114(.057)*	-.087(.140)
Academic Rank		.069(.028)*	.018(.033)	.017(.033)	.018(.034)
Living Arrangements					
Dormitory (reference)					
Off campus			-.034(.034)	-.033(.034)	-.032(.034)
Fraternity			.107(.126)	.104(.126)	.109(.126)
Father's Education			.010(.009)	.010(.009)	.010(.009)
Mother's Education			.002(.010)	.002(.010)	.002(.010)
Community Project			.158(.018)***	.159(.017)***	.158(.018)***
Discussion with Faculty			.137(.017)***	.137(.017)***	.138(.017)***
Interaction Effects					
Gender				-.042(.029)	
Native American					.093(.106)
Asian					.029(.105)
Hispanic					.144(.149)
Other					.032(.079)
Prefer Not to Respond					-.015(.064)
Constant	1.55(.036)***	1.47(.063)***	1.13(.075)***	1.09(.080)***	1.13(.076)***
R	.457***	.470***	.543***	.544***	.544***
R-Squared	.209	.221	.295	.296	.296
Adj. R-Squared	.208	.218	.290	.290	.289
% change in R-Square		5.7	33.4	.3	.3
df	1	8	14	15	19

* p < .05; ** p < .01; *** p < .001

As explained previously, a gender x climate for diversity interaction term was added to the regression equation represented by Model 3. This term did not reach statistical significance, suggesting that the positive association between personal and social gains and climate for diversity did not differ between females and males (see Model 4). In Model 5, a series of interaction terms crossing racial categories with climate for diversity were added to the regression equation represented by Model 3. As with gender, none of these terms reached statistical significance indicating that the positive association between climate for diversity and personal and social gains did not differ across racial categories. The lack of interaction effects are also revealed in the similar R-squared values for Models 3, 4 and 5. Finally, all three diversity experiences were entered simultaneously into the equation and the results are presented in the next section

Personal and Social Gains and All Diversity Experiences

Table 4.10 presents the unstandardized and standardized OLS regression coefficients of students' personal and social gains on all three diversity experiences. Data revealed that all three diversity experiences were significant predictors of personal and social gains ($p < .001$). Again, comparing the unstandardized coefficients in the Model 3 regression equations with data in Table 4.10, both coursework and interactional diversity unstandardized coefficients decreased from .162 (Model 3, Table 4.7) to .091 (Table 4.10) and from .161 (Model 3, Table 4.8) to .083 (Table 4.10). The climate for diversity coefficient decreased slightly from .288 (Model 3, Table 4.9) to .258 (Table 4.10).

The standardized beta coefficients of the variables are also presented in Table 4.10. Data do indeed indicate that interactional diversity had a greater relative impact ($\beta = .353$) than either coursework ($\beta = .121$) or climate for diversity ($\beta = .101$) on personal and social gains. The academic activities outside of the classroom (participating in community projects, ($\beta = .155$) and talking with faculty ($\beta = .133$) had strong influences on personal and social gains as well. Five additional variables were also significant predictors of personal and social gains: (a) females had lower personal and social gains compared to males ($p < .05$), when compared to White students (b) Hispanic students had higher personal and social gains ($p < .05$) and (c) PNR students had lower personal and social gains ($p < .01$) and finally, students participating in activities outside of the classroom had higher personal and social gains than those who did not ($p < .001$). The proportion of variance in personal and social gains accounted for by all the predictor variables was about 32%. The next section presents the results from institutional satisfaction and diversity experiences.

Institutional Satisfaction and Diversity Experiences

This section describes in detail the results from the regression analyses of institutional satisfaction on diversity experiences. A summary of the regression of

Table 4.10 OLS Regression Coefficients of Students' Personal and Social Gains on Diversity Experiences

Variables	Unstandardized Coefficients	Standardized Coefficients
	b(SE)	Beta
Coursework Diversity	.091(.016)***	.121
Interactional Diversity	.083(.018)***	.353
Climate for Diversity	.258 (.015)***	.101
Gender (1 = female)	-.052 (.026)*	-.039
Race		
White(reference)		
Native American	-.060(.090)	-.013
Asian	.129(.087)	.029
Hispanic	.248(.115)*	.042
Other	-.135(.080)	-.033
Prefer Not to Respond	-.154(.056)**	-.054
Academic Rank	.032(.033)	.024
Living Arrangements		
Dormitory (reference)		
Off campus	-.030(.034)	-.022
Fraternity	.100(.124)	.016
Father's Education	.008(.009)	.021
Mother's Education	.000(.010)	-.001
Community Project	.134(.018)***	.155
Discussion with Faculty	.105(.017)***	.133
Constant	.83(.081)***	
R	.568	
R-Squared	.323	
Adj. R-Squared	.317	
df	16	

* p < .05; ** p < .01; ***p < .001

institutional satisfaction on coursework diversity is presented first, followed by the results from the regression analyses of interactional diversity and climate for diversity respectively.

Institutional Satisfaction on Coursework Diversity

The results for the main effects regression of institutional satisfaction on coursework diversity and selected background and control variables are presented in Table 4.11. Across the first three main effects regression models, coursework diversity was a positive and statistically significant predictor of student's self-report on institutional satisfaction. The baseline estimate of coursework diversity in Model 1 revealed an unstandardized coefficient of about .11 ($p < .001$), suggesting that a one-unit increase in coursework diversity (e.g., moving from "sometimes" to "often") is associated with a .11 increase in a student's report on institutional satisfaction. By itself, an R-square value of .012 indicates that individual differences in coursework diversity explained a modest percentage of the individual differences in institutional satisfaction (1.2%).

In Model 2, control variables for race and academic rank were entered into the regression equation. The coefficient for coursework diversity retained both its coefficient size (.107) and level of statistical significance ($p < .001$). However, only one control

Table 4.11 OLS Regression of Institutional Satisfaction on Coursework Diversity

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
	b(SE)	b(SE)	b(SE)	b(SE)	b(SE)
Coursework Diversity	.110(.023)***	.107(.024)**	.074(.024)**	.102(.033)**	.077(.026)**
Gender (1= Female)		-.011(.042)	-.032(.042)	.124(.130)	.033(.042)
Race					
White (reference)					
Native American		.062(.145)	.048(.144)	.056(.144)	-.676(.558)
Asian		-.244(.139)	-.282(.139)*	-.285(.139)*	.114(.394)
Hispanic		-.068(.183)	-.109(.182)	-.116(.127)	-.414(.498)
Other		-.111(.12&)	-.166(.127)	-.166(.182)	.431(.411)
Prefer Not to Respond		-.245(.089)**	-.236(.089)**	-.241(.089)**	-.322(.278)
Academic Rank		-.074(.042)	-.026(.052)	-.028(.052)	-.022(.052)
Living Arrangements					
Dormitory (reference)					
Off campus			-.143(.053)**	-.144(.053)	-.143(.053)**
Fraternity			.000(.197)	-.006(.197)	-.010(.197)
Father's Education			.030(.014)*	.030(.014)*	.031(.014)*
Mother's Education			-.004(.016)	.004(.016)	-.004(.016)
Community Project			.034(.028)	.032(.028)	.033(.028)
Discussion with Faculty			.128(.026)***	.129(.026)***	.128(.026)***
Interaction Effects					
Gender				-.059(.047)	
Native American					.257(.192)
Asian					-.152(.142)
Hispanic					.116(.176)
Other					-.201(.132)
Prefer Not to Respond					.031(.096)
Constant	-.290(.065)***	-.143(.099)	-.435(.118)***	-.509(.132)***	-.449(.121)***
R	.108***	.140***	.205***	.207***	.240***
R-Squared	.012	.020	.042	.043	.058
Adj. R-Squared	.011	.015	.035	.035	.048
% change in R-Square		67	110	2	38
df	1	8	14	15	19

p <.05; ** p < .01; ***p <.001

variable reached statistical significance in this model: (a) when compared to White students, those who preferred not to state their race had lower levels of institutional satisfaction. The addition of these control variables increased the R-square by 67% from .012 in Model 1 to .020 in Model 2. In Model 3, an additional block of control variables that measured living arrangements, parental education, and academic activities outside of the classroom were entered into the regression equation. As in Model 2, the association between coursework diversity and institutional satisfaction remained positive and statistically significant. However, the coefficient for coursework diversity decreased 31% from about .11 in Model 2 to .074 in Model 3. Among this block of control variables, Asian and PNR groups reported lower institutional satisfaction than White students and students who were more likely to have discussions about academics with faculty outside of the classroom were likely to report higher levels of institutional satisfaction. Compared to students living in the dormitory, students who lived off campus reported lower levels of institutional satisfaction. The largest effect size as measured by the R-square value was observed in Model 3. As a group, all of the variables in Model 3 explained 4.2% of individual differences in institutional satisfaction, which represented a 110% increase in explained variance from Model 2.

A series of interaction terms were introduced to regression Model 3. In Model 4, a gender x coursework diversity interaction term was added to the regression equation. This term did not reach statistical significance, suggesting that the positive association between coursework diversity and institutional satisfaction did not differ between females and males. In Model 5, a series of interaction terms crossing racial categories with

coursework diversity were added to the regression equation represented by Model 3. As with gender, none of these terms reached statistical significance indicating that the positive association between coursework diversity and educational gains did not differ across racial categories. The following section presents the results from institutional satisfaction and interactional diversity.

Institutional Satisfaction on Interactional Diversity

Table 4.12 provides the results of the main effects regression of institutional satisfaction on interactional diversity. The three main effects regression models show that interactional diversity was a positive and statistically significant predictor of student's self-report on institutional satisfaction. The baseline estimate of interactional diversity in Model 1 revealed an unstandardized coefficient of about .18 ($p < .001$). This result indicates that a one-unit increase in interactional diversity (e.g., moving from "sometimes" to "often") is associated with a .18 unit increase in a student's report on institutional satisfaction. By itself, an R-square value of .026 indicated that individual differences in coursework diversity explained a modest percentage of the individual differences in institutional satisfaction (2.6%). In Model 2, race and academic rank control variables were entered into the regression equation. The coefficient for interactional diversity increased in size to (.19) and was significant ($p < .001$). Two control variables in Model 2 reached statistical significance and are considered predictors of institutional satisfaction: (a) compared to White students, those who preferred not to state their race had lower levels of institutional satisfaction and (b) females had lower levels of institutional satisfaction than males. The addition of academic rank and race

Table 4.12 OLS Regression Coefficients of Institutional Satisfaction on Interactional Diversity

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
	b(SE)	b(SE)	b(SE)	b(SE)	b(SE)
Interactional Diversity	0.177(.025)***	0.186(.025)**	0.143(.027)***	.120(.035)***	.155(.029)***
Gender (1= Female)		-.034(.041)	-.045(.041)	-.227(.088)*	-.112(.028)***
Race					
White (reference)					
Native American		.022(.144)	.019(.143)	.016(.143)	.033(.150)
Asian		-.233(.138)	-.267(.138)	-.270(.138)*	-.288(.139)*
Hispanic		-.206(.183)	-.206(.182)	-.205(.182)	-.383(.240)
Other		-.187(.127)	-.217(.126)	-.218(.126)	.023(.154)
Prefer Not to Respond		-.266(.089)**	-.255(.088)**	-.256(.088)**	-.265(.089)**
Academic Rank		-.089(.041)*	-.037(.052)	-.036(.052)	-.033(.052)
Living Arrangements					
Dormitory (reference)					
Off campus			-.131(.053)*	-.134(.053)*	-.134(.053)*
Fraternity			-.030(.196)	-.024(.196)	-.034(.196)
Father's Education			.026(.014)	.026(.014)	.026(.014)
Mother's Education			-.003(.016)	-.002(.016)	-.004(.016)
Community Project			.031(.028)	.032(.028)	.033(.028)
Discussion with Faculty			.104(.026)***	.103(.026)***	.103(.026)***
Interaction Effects					
Gender				.050(.050)	
Native American					-.161(.131)
Asian					-.061(.153)
Hispanic					.223(.211)
Other					-.397(.144)**
Prefer Not to Respond					.043(.090)
Constant	-.429(.064)***	-.272(.092)**	-.506(.112)***	-.449(.126)***	-.535(.115)***
R	.161***	.191***	.228***	.229***	.240***
R-Squared	.026	.037	.052	.053	.058
Adj. R-Squared	.025	.032	.045	.045	.048
% change in R-Square		42	40.5	1.9	11.5
df	1	8	14	15	19

* p < .05; ** p < .01; ***p < .001

variables increased the R-square by about 42% from .026 in Model 1 to .037 in Model 2.

When the control variables corresponding to living arrangements, parental education, and academic activities outside were entered in Model 3, a 41% increase in R-square was observed, however, the association between interactional diversity and institutional satisfaction decreased 23% from about .19 in Model 2 to .14 in Model 3. In Model 3, additional predictors of institutional satisfaction were (a) compared to students living in dormitories, individuals living off campus had lower reports of institutional satisfaction ($-.134$, $p < .05$), (b) PNR students compared to White students had lower institutional satisfaction ($-.256$, $p < .01$) and (c) students who discussed ideas with faculty outside of the classroom had higher institutional satisfaction ($.103$, $p < .001$). In Model 4 where the interaction term for gender and interactional diversity was added to the full regression model from Model 3, the gender interaction term did not reach statistical significance indicating that the positive association between interactional diversity and institutional satisfaction did not differ between females and males. In Model 5, a series of interaction terms crossing racial categories with interactional diversity were added to the regression equation represented by Model 3. One interaction variable reached statistical significance, Other ($-.397$, $p < .01$). This result suggests that an association between interactional diversity and institutional satisfaction did differ across racial categories. From the data, the negative interaction coefficient suggests that the positive association between interactional diversity and institutional satisfaction is significantly less for Other than when compared to Whites. The following section presents the results from the regression of institutional satisfaction on climate for diversity.

Institutional Satisfaction on Climate For Diversity

The results for the main effects regression of student's self reports on climate for diversity and selected background and control variables are presented in Table 4.13. A quick look across the first three regression models showed that climate for diversity was a positive and statistically significant predictor of student's self reports on institutional satisfaction. The baseline estimate of climate for diversity in Model 1 revealed an unstandardized coefficient of .26 ($p < .001$), suggesting that a one-unit increase in climate for diversity (e.g., moving from "some" to "quite a bit") is associated with a .26 increase in institutional satisfaction. The R-square value of .070 indicates that individual differences in climate for diversity explained 7% of the individual differences in institutional satisfaction. In Model 2, control variables for race and academic rank were entered into the regression equation, the coefficient for climate for diversity slightly decreased (.257) although the level of statistical significance ($p < .001$) was retained. One control variable in Model 2 reached statistical significance: (a) compared to White students, those who preferred not to state their race had lower levels of institutional satisfaction. The addition of the control variables in Model 2 increased the R-square value but only modestly, from .070 in Model 1 to .074 in Model 2. In Model 3, an additional block of control variables that tapped living arrangements, parental education, and academic activities outside of the classroom were entered into the regression equation represented in Model 2. As observed in Model 2, the association between climate for diversity and institutional satisfaction remained positive and statistically significant ($p < .001$).

Table 4.13 OLS Regression Coefficients of Institutional Satisfaction on Climate for Diversity

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
	b(SE)	b(SE)	b(SE)	b(SE)	b(SE)
Climate for Diversity	.260(.022)***	.257(.022)***	.234(.023)***	.260(.030)***	.227(.025)***
Gender (Female = 1)		.000(.040)	-.015(.041)	.111(.104)	-.018(.041)
Race					
White (reference)					
Native American		.075(.141)	.071(.140)	.075(.140)	.543(.387)
Asian		-.224(.135)	-.254(.135)	-.247(.135)	-.132(.362)
Hispanic		-.093(.123)	-.118(.178)	-.116(.178)	-1.218(.543)*
Other		.098(.123)	-.141(.123)	-.130(.124)	-.511(.298)
Prefer Not to Respond		-.188(.087)*	-.194(.086)*	-.193(.086)*	-.235(.214)
Academic Rank		-.003(.041)	.025(.051)	.023(.031)	.022(.051)
Living Arrangements					
Off campus			-.094(.052)	-.092(.052)	-.091(.052)
Fraternity			-.005(.192)	-.010(.192)	-.002(.192)
Father's Education			.033(.014)*	.034(.014)*	.034(.014)*
Mother's Education			.003(.015)	.003(.015)	.003(.015)
Community Project			-.023(.027)	.024(.027)	.025(.027)
Discussion with Faculty			.085(.025)**	.085(.025)**	.087(.025)**
Interaction Effects					
Gender				-.059(.044)	
Native American					-.211(.162)
Asian					-.059(.160)
Hispanic					.488(.288)*
Other					.164(.120)
Prefer Not to Respond					.020(.098)
Constant	-.564(.052)***	-.536(.091)***	-.809(.114)***	-.867(.122)***	-.802(.116)***
R	.265***	.273***	.296***	.297***	.303***
R-Squared	.070	.074	.087	.088	.092
Adj. R-Squared	.070	.070	.081	.081	.082
% change in R-Square		5.7	17.5	1.1	1.2
df	1	8	14	15	19

* p < .05; ** p < .01; ***p < .001

However, the coefficient decreased to .234 (Model 3) from .257 (Model 2) which represented a 9% decrease in the size of the coefficient. Among the block of control variables that were entered in Model 3, PNR students, father's education and students who discuss academics with faculty outside of the classroom were significant predictors of climate for diversity. As a group, all of the variables in Model 3 explained about 9% of individual differences in climate for diversity, which overall represents a 17.5% increase in explained variance from Model 3.

In the series of interaction terms, the first of which are reported in Model 4, a gender x climate for diversity interaction term was added to the regression equation represented by Model 3. This term did not reach statistical significance, suggesting that the positive association between climate for diversity and institutional satisfaction did not differ between females and males. A series of interaction terms crossing racial categories with climate for diversity were added to the regression equation represented in Model 3. While some of the variables retained their significance, one interaction term in Model 5 reached statistical significance (Hispanic .488, $p < .05$). This result suggests that the association between climate for diversity and institutional satisfaction did differ across racial categories. That is, the positive association between climate for diversity and institutional satisfaction was significantly greater for Hispanic students when compared to their White counterparts.

Institutional Satisfaction on All Three Diversity Experiences

Finally, to assess the strength and influence of each diversity experience on institutional satisfaction, the unstandardized and beta coefficients are presented in Table

Table 4.14 OLS Regression Coefficients of Institutional Satisfaction and Diversity Experiences

Variables	Unstandardized Coefficients	Standardized Coefficients
	b(SE)	Beta
Coursework Diversity	.005(.025)	.005
Interactional Diversity	.102(.028) ^{***}	.223
Climate for Diversity	.219(.024) ^{***}	.093
Gender (1 = female)	-.011 (.041)	-.006
Race		
White(reference)		
Native American	.041(.140)	.007
Asian	-.244(.135)	.029
Hispanic	-.181(.178)	-.023
Other	-.190(.124)	-.034
Prefer Not to Respond	-.220(.086) [*]	-.057
Academic Rank	.024(.051)	.013
Living Arrangements		
Dormitory (reference)		
Off campus	-.087(.052)	-.048
Fraternity	-.023(.192)	-.003
Father's Education	.031(.014) [*]	.058
Mother's Education	.002(.015)	.004
Community Project	.012(.027)	.010
Discussion with Faculty	.061(.026) [*]	.058
Constant	-.961(.126) ^{***}	
R	.308	
R-Squared	.095	
Adj. R-Squared	.087	
Df	16	

* p < .05; ** p < .01; ***p < .001

4.14. Only two diversity experiences were significant predictors of institutional satisfaction: interactional and climate for diversity. Comparing the unstandardized coefficients determined from Model 3 regressions with data in Table 4.14, the unstandardized coefficients for both of these variable decreased from .143 (Model 3, Table 4.12) to .102 and from .234 (Model 3, Table 4.13) to .219 (Table 4.14). Coursework diversity did not reach statistical significance in this model even though this variable was statistically significant by itself (.074, Model 3, Table 4.11). In looking at the standardized coefficients in Table 4.14, data revealed that interactional diversity ($\beta = .223$, $p. < .001$) had the highest relative impact on institutional satisfaction than climate for diversity ($\beta = .093$, $p. < .001$) and coursework diversity ($\beta = .005$). The coefficient for coursework diversity is nearly reduced to zero when forced to compete with the other measures of diversity. This result implies that interactional and climate for diversity measures explained away the earlier, direct influence of coursework diversity on student's institutional satisfaction found in Table 4.11. Discussions with faculty and father's education were also significant predictors of this student outcome. The next section presents the results from supportive campus environment and diversity experiences.

Supportive Campus Environment and Diversity Experiences

This section describes in detail the results from the regression analyses of a supportive campus environment outcome on diversity experiences. A summary of the regressions of this outcome on coursework diversity is presented first, followed by the

results from the regression analyses of interactional diversity and climate for diversity respectively.

Supportive Campus Environment and Coursework Diversity

The results for the main effects regression of student's report on a supportive campus environment on coursework diversity and selected background and control variables are presented in Table 4.15. Coursework diversity was a positive and statistically significant predictor of supportive campus environment, even in the presence of a number of control variables across the first three regression models. The baseline estimate of coursework diversity in Model 1 revealed an unstandardized coefficient of about .13 ($p < .001$). This means that a one-unit increase in coursework diversity (e.g., moving from "sometimes" to "often") is associated with a .13 increase in the outcome of a supportive campus environment. By itself, an R-square value of .03 indicates that individual differences in coursework diversity explained 3% of the individual differences in the supportive campus environment outcome.

Control variables for race and academic rank were entered in Model 2. However, these variables do not appear to account fully for the earlier influence of coursework diversity. Two control variables reached statistical significance: (a) when compared to White students, those who preferred not to state their race had lower levels of a supportive campus environment, and (b) seniors versus their freshman counterparts reported lower campus support. The impact of the addition of these control variables to the model was also observed in the large increase in the R-square from .030 in Model 1 to about .07 in Model 2. As a group, all of the variables in Model 2 explained about 7% o

Table 4.15 OLS Regression Coefficients of Supportive Campus Environment on Coursework Diversity

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
	b(SE)	b(SE)	b(SE)	b(SE)	b(SE)
Coursework Diversity	.131(.017)***	.118(.017)***	.064(.017)***	.075(.023)***	.075(.019)***
Gender (1 = Female)		-.035(.031)	-.056(.030)	.005(.092)	-.058(.030)*
Race					
White (reference)					
Native American		-.016(.105)	-.057(.101)	-.054(.101)	.016(.392)
Asian		.082(.102)	.043(.098)	.042(.098)	.045(.277)
Hispanic		.008(.134)	-.063(.128)	-.065(.128)	-.135(.350)
Other		-.085(.093)	-.179(.089)*	-.179(.089)*	-.147(.289)
Prefer Not to Respond		-.194(.065)**	-.171(.062)**	-.173(.062)**	-.298(.195)
Academic Rank		-.241(.03)***	-.189(.037)***	-.190(.036)***	-.186(.037)***
Living Arrangements					
Dormitory (reference)					
Off campus			-.189(.04)***	-.189(.04)***	-.189(.038)***
Fraternity			.082(.139)	.080(.139)	.081(.139)
Father's Education			.012(.010)	.012(.010)	.012(.010)
Mother's Education			-.005(.011)	-.005(.011)	-.005(.011)
Community Project			.074(.02)***	.073(.018)***	.074(.020)***
Discussion with Faculty			.196(.018)***	.196(.018)***	.195(.018)***
Interaction Effects					
Gender				-.023(.033)	
Native American					-.001(.100)
Asian					-.027(.135)
Hispanic					.027(.124)
Other					-.012(.092)
Prefer Not to Respond					-.171(.067)**
Constant	1.89(.048)***	2.32(.072)***	1.99(.083)***	1.96(.093)***	1.96(.085)***
R	.172***	.263***	.390***	.390***	.394***
R-Squared	.030	.069	.152	.152	.155
Adj. R-Squared	.029	.065	.146	.146	.147
% change in R-Square		130	120	0	.7
Df	1	8	14	15	19

* p < .05; ** p < .01; ***p < .001

the individual differences in coursework diversity. Overall this represented a 130% increase in the explained variance from Model 1. Another set of control variables were entered into Model 3 that tapped living arrangements, parental education, and academic activities outside of the classroom. As in Model 2, the association between coursework diversity and supportive campus environment gains remained positive and statistically significant. However, the coefficient for coursework diversity decreased from about .12 (Model 2) to .06 (Model 3), representing a 46% decrease in the size of the coefficient. Several control variables in Model 3 were statistically significant including academic rank and the racial categories “Other” and PNR (compared to White). These associations had a negative correlation with supportive campus environment. Both academic activities outside of the classroom emerged as significant and positive predictors of supportive campus environment. That is students involved in either of the activities reported high levels of a supportive campus environment. The percent increase in the explained variance (R-squared) in Model 3 from Model 2 was 120%.

In the interaction models, the gender x coursework diversity interaction term did not reach statistical significance, suggesting that the positive association between coursework diversity and personal and supportive campus environment did not differ between females and males. However, in Model 5 where the race and ethnicity x coursework diversity interaction term entered the regression equation, the interaction term PNR x coursework diversity emerged as a significant and negative ($b = -.171, p < .01$) predictor of supportive campus environment. The negative interaction coefficient suggests that the positive association between coursework diversity and supportive

campus environment was significantly less for PNR than when compared to Whites. The following section presents the findings from a supportive campus environment on interactional diversity.

Supportive Campus Environment and Interactional Diversity

The results for the main effects regression of student educational gains on coursework diversity and selected background and control variables are presented in Table 4.16. The first three regression models reveal that interactional diversity was a positive and statistically significant predictor of a supportive campus environment. The baseline estimate of interactional diversity in Model 1 revealed an unstandardized coefficient of about .18 ($p < .001$), suggesting that a one-unit increase in interactional diversity (e.g., moving from “sometimes” to “often”) was associated with a .18 increase in a support campus environment. By itself, an R-square value of .046 indicated that individual differences in coursework diversity explained 4.6% of the individual differences in educational gains.

In Model 2, control variables for race and academic rank were entered into the regression equation. The coefficient for interactional diversity retained both its coefficient size (.185) and level of statistical significance ($p < .001$). Three control variables reached statistical significance although all were negatively associated with a supportive campus environment: (a) compared to males, females have lower levels of a supportive campus environment (b) compared to White students, those who preferred not to state their race had lower levels of a supportive campus environment, and (c) seniors reported lower campus support than do their freshman in this study. As a result, the

Table 4.16 OLS Regression Coefficients of Supportive Campus Environment on Interactional Diversity

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
	b(SE)	b(SE)	b(SE)	b(SE)	b(SE)
Interactional Diversity	.177(.019)***	.185(.018)***	.113(.019)***	.107(.025)***	.124(.02)***
Gender (1 = Female)		-.061(.03)*	-.067(.029)*	-.098(.090)	-.066(.029)*
Race					
White (reference)					
Native American		-.054(.104)	-.079(.101)	-.080(.101)	-.087(.106)
Asian		.093(.100)	.054(.097)	.054(.097)	.031(.098)
Hispanic		-.129(.132)	-.140(.128)	-.140(.128)	-.113(.169)
Other		-.157(.092)	-.218(.089)*	-.218(.089)*	-.235(.108)*
Prefer Not to Respond		-.214(.064)**	-.186(.062)**	-.186(.062)**	-.178(.063)**
Academic Rank		-.258(.03)***	-.199(.036)***	-.198(.036)***	-.195(.036)***
Living Arrangements					
Dormitory (reference)					
Off campus			-.180(.04)***	-.181(.04)***	-.183(.037)***
Fraternity			.058(.138)	.059(.138)	.054(.138)
Father's Education			.009(.010)	.009(.010)	.009(.010)
Mother's Education			-.003(.011)	-.003(.011)	-.004(.011)
Community Project			.072(.019)***	.073(.018)***	.072(.019)***
Discussion with Faculty			.178(.018)**	.178(.018)***	.179(.018)***
Interaction Effects					
Gender				.013(.035)	
Native American					.011(.108)
Asian					-.181(.092)*
Hispanic					-.047(.148)
Other					.016(.102)
Prefer Not to Respond					-.058(.063)
Constant	1.80(.048)***	2.23(.067)***	1.95(.079)***	1.96(.088)***	1.92(.081)***
R	.215***	.308***	.403***	.403***	.406***
R-Squared	.046	.095	.162	.162	.165
Adj. R-Squared	.046	.091	.156	.156	.156
% change in R-Square		107	70.5	0	1.9
Df	1	8	14	15	19

* p < .05; ** p < .01; *** p < .001

addition of these control variables did increase the R-square by about 107% from .046 in Model 1 to .095 in Model 2. An additional block of control variables that represented living arrangements, parental education, and academic activities outside of the classroom were entered in Model 3. As observed in Model 2, the positive association between interactional diversity and supportive campus environment remained positive and statistically significant. However, the coefficient decreased to .11 (Model 3) representing a about a 39% decrease in the size from Model 2 (.19). The additional control variables; other, off campus, and both academic activities outside of the classroom, emerged as significant predictors of supportive campus environment.

The interaction term between gender x interactional diversity (Model 4) did not reach statistical significance. However, in Model 5 where a racial and ethnic x interactional diversity interaction term was introduced into the full regression model presented in Model 3, a negative association with Asian students compared to White students emerged (-.181, $p < .05$). This negative interaction coefficient suggests that the positive association between interactional diversity and supportive campus environment was significantly less for Asian students then when compared to White students. The next section presents the finding of supportive campus environment on climate for diversity experience.

Supportive Campus Environment and Climate for Diversity

The main effects regression of the perception of a supportive campus environment on climate for diversity and selected background and control variables are presented in Table 4.17. Climate for diversity was a positive and statistically significant predictor of

the supportive campus environment outcome, even in the presence of a wide range of control variables. The baseline estimate of climate for diversity in Model 1 revealed an unstandardized coefficient of about .40 ($p < .001$), suggesting that a one-unit increase in climate for diversity (e.g., moving from “some” to “quite a bit”) is associated with a .40 increase in a supportive campus environment. By itself, an R-square value of .30 indicates that individual differences in coursework diversity explained about 30 % of the individual differences in the supportive campus environment outcome.

In Model 2, control variables for race and academic rank were entered into the regression equation, but these variables do not appear to account fully for the earlier influence of climate for diversity, although the coefficient for coursework diversity retained nearly the same coefficient size (.39) and level of statistical significance ($p < .001$). Additional predictors of supportive campus environment included: (a) compared to White students, those who preferred not to state their race had lower levels of perceived campus support, and (b) seniors reported lower levels of perceived support than freshman. The addition of these control variables did increase the R-square but by only about 4% from .30 in Model 1 to .32 in Model 2.

The control variables of living arrangements, parental education, and academic activities outside of the classroom were entered into Model 3. As observed in Model 2, the association between climate for diversity and supportive campus environment remained positive and statistically significant. However, the coefficient for climate for diversity decreased to .35 (Model 3), from .39 (Model 2). This represents about a 9% decrease in the size of the coefficient. Two new predictors of supportive campus

Table 4.17 OLS Regression Coefficients of Supportive Campus Environment on Climate for Diversity

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
	b(SE)	b(SE)	b(SE)	b(SE)	b(SE)
Climate for Diversity	.404(.014)***	.390(.014)***	.354(.015)***	.381(.019)***	.348(.016)***
Gender (1 = Female)		-.005(.026)	-.018(.026)	.117(.065)	-.022(.026)
Race					
White (reference)					
Native American		-.007(.090)	-.029(.088)	-.025(.088)	-.182(.244)
Asian		.113(.087)	.086(.085)	.094(.085)	-.216(.229)
Hispanic		-.029(.115)	-.071(.112)	-.069(.112)	-.146(.342)
Other		-.082(.079)	-.150(.078)	-.139(.079)	-.458(.188)*
Prefer Not to Respond		-.117(.056)*	-.117(.054)*	-.115(.054)*	.015(.135)
Academic Rank		-.126(.026)***	-.102(.032)**	-.104(.032)**	-.103(.032)**
Living Arrangements					
Dormitory (reference)					
Off campus			-.114(.033)**	-.112(.033)**	-.113(.033)**
Fraternity			.077(.121)	.073(.121)	.079(.121)
Father's Education			.017(.009)*	.017(.009)*	.017(.009)
Mother's Education			.005(.010)	.005(.010)	.005(.010)
Community Project			.123(.016)***	.049(.017)**	.05(.017)**
Discussion with Faculty			.049(.017)**	.123(.016)***	.124(.016)**
Gender				-.063(.028)*	
Native American					.069(.102)
Asian					.144(.101)
Hispanic					.033(.144)
Other					.136(.076)
Prefer Not to Respond					-.067(.062)
Constant	1.36(.033)***	1.59(.059)***	1.314(.072)***	1.25(.077)***	1.32(.073)***
R	.550***	.561***	.592***	.593***	.594***
R-Squared	.303	.315	.350	.352	.353
Adj. R-Squared	.303	.312	.345	.347	.346
% change in R-Square		4	11	.6	.9
Df	1	8	14	15	19

* p < .05; ** p < .01; ***p < .001

environment emerged in Model 3 in addition to the predictors observed in Model 2: (a) compared to students living in the dorm, individuals living off campus had lower levels of perceived campus support and (b) father's education (.017, $p < .017$). This latter finding suggests that students whose fathers had some education reported higher levels of campus support than students whose fathers did not have education.

In the series of interaction terms, the first presented in Model 4, the gender x climate for diversity interaction term was added to the regression equation from Model 3. This term did reach statistical significance (-.063, $p < .05$), suggesting that the negative interaction term indicates that the positive association between climate for diversity and supportive campus environment was significantly smaller for females when compared to their male counterparts. In the last interaction model, racial categories were crossed with a climate for diversity term, and then added to the regression equation represented in Model 3. No interaction terms in Model 5 reached statistical significance suggesting that the association between climate for diversity and supportive campus environment did not differ across racial categories.

Supportive Campus and All Three Diversity Experiences

Finally, to assess the relative strength and influence of each diversity experience on supportive campus environment, all diversity experiences were entered into the model simultaneously (Table 4.18). Data in Table 4.18 reveal that two diversity experiences were significant predictors of a supportive campus environment: interactional diversity and climate diversity with unstandardized coefficients of .348 and .056 respectively. When these values were compared to their respective Model 3 coefficients, the

Table 4.18 OLS Regression Coefficients of Supportive Campus Environment and Diversity Experiences

Variables	Unstandardized Coefficients	Standardized Coefficients
	b(SE)	Beta
Coursework Diversity	-.014(.016)	-.019
Interactional Diversity	.348(.015)**	.068
Climate for Diversity	.056(.018)***	.474
Gender (1 = female)	-.020(.26)	-.015
Race		
White(reference)		
Native American	.043(.088)	-.009
Asian	.092(.085)	.020
Hispanic	-.108(.112)	-.018
Other	-.173(.078)*	-.042
Prefer Not to Respond	-.128(.055)*	-.044
Academic Rank	-.105(.032)***	-.078
Living Arrangements		
Dormitory (reference)		
Off campus	-.110(.033)***	-.081
Fraternity	.066(.121)	.010
Father's Education	.016(.009)	.039
Mother's Education	.005(.010)	.011
Community Project	.045(.017)**	.052
Discussion with Faculty	.112(.016)***	.142
Constant	1.26(.079)***	
R	.595	
R-Squared	.354	
Adj. R-Squared	.348	
df	16	

* p < .05; ** p < .01; ***p < .001

unstandardized coefficient for interactional diversity increased from .113 (Model 3, Table 4.16) to .348 (Table 4.18) and the unstandardized coefficient for climate for diversity decreased from .354 (Model 3, Table 4.17) to .056 (Table 4.18). Notably, the unstandardized coefficient for coursework diversity (.064) which was statistically significant in the earlier model (Model 3, Table 4.15) decreased significantly (-.014, Table 4.18) and did not reach statistical significance. This result suggests that the influence of the other two diversity measures explained away any effect of the coursework diversity measure on this student outcome. This exact trend was also identified in the previous result from the student outcome of institutional satisfaction. When looking at the standardized coefficients, data revealed that climate for diversity ($\beta = .474$, $p < .001$) has the highest relative impact on supportive campus environment followed by interactional diversity ($\beta = .068$, $p < .01$). Again, coursework diversity ($\beta = -.019$) did not reach statistical significance. Activities outside of the classroom, off campus living, and academic rank were also significant predictors of supportive campus environment in this model.

Summary of Diversity Experiences on Student Outcomes

The results from the main effect models in this investigation support the first research hypothesis that undergraduate students at Montana State University who more often engage in diversity experiences at the micro (interactional), meso (coursework) and macro (climate) levels report higher gains in college student outcomes than students who participate less often. A useful way to conceptualize the results in support of this

hypothesis was to use the regression equations derived from the regression models where all three diversity measured were entered into the equation simultaneously and predict how students scored on the different student outcomes given high and low levels of diversity experience participation.

For example, using the data from Table 4.6-general education gains regressed on all three diversity experiences, I predicted how a student would score on the general education outcome given high and low levels of participation in diversity experiences. A regression equation with multiple predictors takes on the general form of $\hat{Y} = b_1 * X_1 + b_2 * X_2 + b_3 * X_3, + c$. \hat{Y} is the estimated dependent variable, the b's are the regression coefficients for the corresponding X (independent) variables, the X's are the inputted values for each independent variable, and c is the constant or intercept which includes an error term. Based on the information provided in Table 4.6, the following equation applies for a female, senior, Native American student at MSU who lives off campus, whose parents had some level of education, and who participated in some levels of academic activities outside of the classroom:

$$\hat{Y} = .124(X_1) + .166(X_2) + .063(X_3) - .006(X_4) - .110(X_5) - .003(X_6) + .062(X_7) \\ + .062(X_8) + .026(X_9) .124(X_{10}) + .166(X_{11}) + 1.74$$

For this student who reports high levels of diversity experiences, the equation would take on the form of $Y = .124(4) + .166(4) + .063(4) - .006(1) - .110(1) - .003(2) + .062(1) + .062(4) + .026(4) .124(2) + .166(2) + 1.74$ where X_1 , X_2 and X_3 were replaced by the number 4 (corresponding to high levels of diversity experiences). For the same student whose levels of diversity experiences are low, X_1 , X_2 and X_3 are replaced with the value

of 1 (corresponding to low levels of diversity experiences). Solving for the equation, a female, senior, Native American student at MSU student reporting high levels of diversity experiences has a general education index of 4.0. This value corresponds to a response value from the NSSE survey of “very much” when asked about the extent the experience at the institution has contributed to knowledge and skills in general education. The same student who reports low levels of diversity experiences has a predicted general education gains index of 2.9 or a response value of “quite a bit” when answering the same question. It is clear then that the individual participating in high levels of the diversity experiences, report a higher educational gain than the same student participating at low levels of diversity experiences. This trend is consistent whether the student lives on or off campus, is a freshman or not, and is White or another reported race. The same strategy was used to predict values for the three other dependent variables using the same student characteristic profile previously mentioned (Table 4.19) and using the coefficients from Tables 4.10, 4.14, and 4.18.

Table 4.19 Predicting Student Outcomes from Regression Models

<u>Diversity Level</u>	<u>Educational Gains</u>	<u>Personal/Social Gains</u>	<u>Support Campus Environment</u>	<u>Institutional Satisfaction*</u>
High	4.0	2.9	3.2	.635
Low	2.9	1.5	1.8	-.325

* z-score

A female, senior, Native American student at MSU identifying with high levels of diversity experiences has an index of 2.9 in personal and social gains outcomes. This response corresponds to “quite a bit” when asked about to what extent MSU has contributed in the areas of personal and social development from the NSSE survey. The same student, who identifies with low levels of diversity experiences, has a predicted personal and social gain index of 1.5. This value corresponds to a response somewhere between “very little” to “some” on the set of NSSE questions identified for this outcome. For the supportive campus environment outcome, the results are similar where the values of 3.2 versus 1.8 or a response value on the NSSE of “quite a bit” versus “some.” Again, the predicted value in the student outcome is lower for a student who participates less often in diversity experiences than for the student who participates more often in the diversity experiences. The data for institutional satisfaction are reported in z-scores. However, one can interpret that a predicted response value of .636 is in fact .636 standard deviation units above the mean and is certainly a higher value than -.325 standard deviation unit below the mean as identified for the student who experienced diversity at low levels. Again, the first research hypothesis is supported in this investigation.

The findings are mixed for the second research hypothesis that stated undergraduate students at Montana State University who more often experience diversity at the macro level will report lower gains in college student outcomes than students who more often engage in diversity at the micro and meso levels. Experiences of diversity at the micro (interactional) and meso (coursework) levels are thought to be more influential on college student outcomes where face-to-face interactions, in an out of the classroom,

peer and friendship groups, and faculty interactions are known to significantly influence learning (Kuh, 2001; Pascarella & Terenzini, 2005; Renn, 2003; Umbach & Kuh, 2006).

For the three student outcomes of general educational gains, personal and social gains and institutional satisfaction, interactional diversity had the strongest relative impact of the three diversity experiences on these student outcomes. Climate for diversity had the most relative impact for the student outcome of supportive campus environment. Importantly, coursework for diversity becomes a non-influential experience once controlled for the other diversity experiences (see Tables 4.14 and 4.18). These results are indeed implying that the meso experience is not important for at least institutional satisfaction or supportive campus environment outcomes when controlling for the diversity experiences at the micro and macro levels. This suggests that the meso may not occupy an unique niche in terms of diversity experiences—a niche sandwiched between the micro and macro environmental levels.

Again, using the regression equations from each of the four student outcomes, I can predict the values of student outcomes to provide additional information to help support (and refute) the second research hypothesis. Table 4.20 reveals how a White female, senior, MSU undergraduate student would score on the educational gains index under two different diversity experiences scenarios: (1) high levels of interactional and coursework diversity (micro and meso) and a low level of climate for diversity (macro) and (2) low levels of interactional and coursework diversity and a high level of climate for diversity. Table 4.20 also includes the predicted values outcomes for a Native American student under identical diversity experiences scenarios.

Table 4.20 Predicting Educational Gains from Diversity Experiences

Variable	White		Native American	
Coursework Diversity	High	Low	High	Low
Interactional Diversity	High	Low	High	Low
Climate for Diversity	Low	High	Low	High
Female	√	√	√	√
Senior	√	√	√	√
Off campus	√	√	√	√
Father's Education	Yes	Yes	Yes	Yes
Mother's Education	Yes	Yes	Yes	Yes
Community Project	Some	Some	Some	Some
Discussion with Faculty	Some	Some	Some	Some
Scores on Educational Gains	4.0	3.3	3.8	3.2

Data in Table 4.20 indicate that scores on educational gains are higher for those students who have high levels of interactional and coursework diversity but low levels of climate for diversity. This holds true whether the student is White or Native American. The difference in educational gains scores between the high and low climate for diversity experience is nearly one standard deviation (i.e. going from “quite a bit” to “very much”). Data are also consistent whether the student is a senior (as noted above) or a freshman living on campus (3.2 and 3.9 for White and 3.1 and 3.8 for Native American-data not shown in Table).

Results for the student outcome, supportive campus environment are presented in Table 4.21. Again, the results reveal that students with high micro and meso experiences have higher predicted values in the supportive campus environment outcome than the same student reporting low levels of micro and meso diversity experiences.

Table 4.21 Predicting Supportive Campus Environment from Diversity Experiences

Variable	White		Native American	
	High	Low	High	Low
Coursework Diversity	High	Low	High	Low
Interactional Diversity	High	Low	High	Low
Climate for Diversity	Low	High	Low	High
Female	√	√	√	√
Senior	√	√	√	√
Off campus	√	√	√	√
Father's Education	Yes	Yes	Yes	Yes
Mother's Education	Yes	Yes	Yes	Yes
Community Project	Some	Some	Some	Some
Discussion with Faculty	Some	Some	Some	Some
Scores on Supportive Campus Environment	2.9	1.9	2.9	1.9

This trend is not consistent however, for all student outcomes. For the outcome of institutional satisfaction, a student with a higher level of climate for diversity experience (macro level) had a higher predicted response value for this outcome than for the same student who reported high levels of interactional and coursework experiences. Table 4.22 presents the predicted outcome values for both a female Native American and White student on institutional satisfaction. A standard deviation unit of .27 (White) and .94 (Native American) above the mean represent higher scores on this measure than a z-score of .002 (White) and .04 (Native American) reported for the same student at high levels of interactional and coursework diversity.

No significant differences in the predicted values for a student experiencing either a high or low level of climate for diversity were observed (Table 4.23) in the student outcome of personal and social gains. For a student reporting a high level of climate for diversity, a response value of 2.5 (White) or 2.4 (Native American) were predicted. For

the same student, 2.3 (White) or 2.2 (Native American) were the predicted values of this outcome for a low level experience in climate for diversity.

Table 4.22 Predicting Institutional Satisfaction from Diversity Experiences

Variable	White		Native American	
	High	Low	High	Low
Coursework Diversity	High	Low	High	Low
Interactional Diversity	High	Low	High	Low
Climate for Diversity	Low	High	Low	High
Female	√	√	√	√
Senior	√	√	√	√
Off campus	√	√	√	√
Father's Education	Yes	Yes	Yes	Yes
Mother's Education	Yes	Yes	Yes	Yes
Community Project	Some	Some	Some	Some
Discussion with Faculty	Some	Some	Some	Some
Z-Scores on Institutional Satisfaction	.002	.27	.04	.94

Table 4.23 Predicting Personal and Social Gains from Diversity Experiences

Variable	White		Native American	
	High	Low	High	Low
Coursework Diversity	High	Low	High	Low
Interactional Diversity	High	Low	High	Low
Climate for Diversity	Low	High	Low	High
Female	√	√	√	√
Senior	√	√	√	√
Off campus	√	√	√	√
Father's Education	Yes	Yes	Yes	Yes
Mother's Education	Yes	Yes	Yes	Yes
Community Project	Some	Some	Some	Some
Discussion with Faculty	Some	Some	Some	Some
Scores on Personal and Social Gains	2.3	2.5	2.2	2.4

The results from the interaction models (Models 4) (gender x diversity experience) did not produce any statistical significance in three of the student outcomes investigated. Therefore, the first interaction research hypothesis that female students at

Montana State University who often engage in diversity experiences at the micro, meso, and macro levels report higher gains in college student outcomes compared to their similarly-engaged male counterparts was not supported in this investigation. Even though the interaction coefficient for a supportive campus environment on climate for diversity x gender did produce a statistically significant coefficient ($b = -.063$, $p < .05$), the correlation was negative implying that the positive interaction between climate for diversity and supportive campus environment was significantly less for women than compared to men.

The results from the interaction models (race and ethnicity x diversity experience) did produce statistically significant results in three out of the four student outcomes. No statistically significant interaction results were observed for any diversity experience with educational gains. Most coefficients for the interaction terms were negative with one exception (Table 4.24). Therefore, the interaction hypothesis; students at Montana State University who are from traditionally under-represented groups on campus and who often engage in diversity experiences at the micro, meso and macro levels will report higher gains in college student outcomes compared to their similarly-engaged counterparts from traditionally represented groups was rejected. The results imply that the positive association between the student outcome and the diversity experience was significantly less for the race identified than when compared to their White counterparts.

Table 4.24 Significant Interaction Terms with Student Outcomes

IV	Race	DV	Unstandardized b
Interactional Diversity	Asian	Supportive Campus	-.181*
Coursework Diversity	PNR	Supportive Campus	-.171*
Climate for Diversity	Hispanic	Institutional Satisfaction	.488*
Interactional Diversity	Other	Institutional Satisfaction	-.397**
Interactional Diversity	Asian	Personal and Social Gains	-.221*

* $p < .05$, ** $p < .01$

Chapter Summary

This chapter presented the results from the data analyses from this quantitative investigation. The first section presented general descriptive analyses of the study sample. The subsequent sections presented findings from how each dependent variable regressed on the focal independent variables. The final section of this investigation; the conclusion section is presented in the next chapter.

CHAPTER 5

CONCLUSIONS

Introduction

The problem addressed in this investigation was that higher education institutions need to know how different groups of undergraduate students experience diversity differently and how these experiences may differentially influence desirable college student outcomes. Information gleaned from this investigation will help to extend knowledge in higher education on diversity issues and its impact on college student outcomes. For example, Gurin et al. (2002) found that informal interaction with diverse peers and classroom diversity had significant effects on the educational outcomes of active thinking, and intellectual engagement for White, African American and Asian students participating in their study. Accordingly, Villapando (2002) reported that regardless of a student's race or ethnicity, those student's who either (1) participated in a racial or cultural workshop, (2) socialized with someone different from themselves, (3) took courses with a faculty member promoting diversity awareness, or (4) perceived a supportive campus environment on diverse issues, had higher levels of institutional satisfaction than those students who did not participate.

The first chapter in this investigation addressed the notion of diversity, diversity experiences, and the positive impact diversity experiences have on a number of student outcomes. The first chapter also identified a gap in the literature and the charge to the higher education sector to extend more research to those populations that are now

becoming increasingly prevalent on college campuses today. The second chapter reviewed the literature on diversity experiences and its relationship to student outcomes. A critique of the diversity literature was also presented. The third chapter described the quantitative methodology used in the investigation and chapter four presented the findings organized for clarity by the specific diversity experience and its affect on each student outcomes. The final chapter discusses the findings and evaluates these findings with comparisons made to the extant literature. Conclusions and recommendation for further research are also presented in this chapter.

Overview

The diversity literature continues to present empirical support on the positive impact of diversity experiences on a number of student outcomes as measured by gains in intellectual, academic, and personal and social development. As a result of experiencing diversity on campus, students are learning to work and engage with others from different backgrounds, and students are learning to contribute to a democratic society (Gurin et al., 2002; Huh & Kuh, 2003; Hurtado, 2007; Nelson Laird & Niskodé-Dossett, 2010; Villalpando, 2002). Very little is known whether gender and different racial and ethnic groups derive the same benefits of diversity experiences. To this end, the purpose of this investigation was to estimate the influence of student engagement in diversity experiences on student's self-reported college outcomes among different groups of undergraduate students at Montana State University. The different student groups in this

investigation were identified by gender and race and ethnicity. The study was guided by the following three research questions:

1. What are the relationships between student's engagement in diversity experiences and student's self-reported college outcomes?
2. To what extent do the relationships between diversity experiences and self-reported college student outcomes vary between females and males?
3. To what extent do the relationships between diversity experiences and self-reported college student outcomes vary between different races and ethnicities?

Bronfenbrenner's Ecology Model provided the conceptual framework for this investigation (Bronfenbrenner, 1979). Bronfenbrenner's Ecology Model holds that an individual's development is influenced by multiple environments identified as the microsystem, mesosystem, exosystem, and macrosystem (Bronfenbrenner's, 1979). This research tapped three of Bronfenbrenner's levels through different measures of diversity experiences. The microsystem was estimated by measures of interactional diversity, which included student exchanges with diverse people and exposure to diverse ideas, information and experiences. The mesosystem was estimated by measures of coursework diversity, which included diverse perspectives in class discussion or writing assignments. The macrosystem was estimated by measures of climate for diversity which included if the institution encouraged contact among students from different economic, social, and racial or ethnic backgrounds.

Summary of Methodology

A quantitative analysis design using secondary survey data from the NSSE was used to answer the research questions. MSU participated in both the 2007 and 2008 NSSE surveys. The data were pooled from both years and analyzed to inform this study. Ordinary least square regression (OLS) was the mathematical model used to examine the strength, direction, and statistical significance of the association between diversity experiences and student outcomes. The analyses provided information about the variance in the dependent variables (student outcomes) not only accounted for by a collective set of independent variables (diversity experiences and control variables) but also on a potential and unique association of an independent variable on the dependent variable while other independent variables were statistically controlled for (Hoyt, Leierer, & Millington, 2006).

Four separate OLS regression analyses were conducted in this investigation—one for each of the student outcomes of interest in this investigation. In each analysis, the diversity experiences of the student served as the focal independent variable to test the baseline association between diversity experiences and each of the four self-reported student outcomes. Several control variables were added to the full regression model as well. After estimating the baseline relationships further regression equations were structured according a model building approach described previously in Chapter 3. To address the research questions that focused on how the influence of diversity experiences varied across group characteristics, each dependent variable was regressed on the interacting term (gender x diversity experience and race and ethnicity x diversity

experience race). The results of the investigation are summarized in the following paragraphs.

Results

In the full main effect regression models, all three diversity experiences (coursework, interactional and climate) significantly predicted student's self-reported gains in general education, personal and social activities, institutional satisfaction and a supportive campus environment. These relationships between diversity experiences and student outcomes remained statistically significant even when a set of control variables (student demographic characteristics, living arrangements, parental education, and academic activities outside of the classroom) were added to the regression equation.

Table 5.1 summarizes the unstandardized coefficients from all Model 3 regressions from Tables 4.3-4.5; Tables 4.7-4.9; Tables 4.11-4.13; and Tables 4.15-4.17.

Table 5.1 Summary of the Unstandardized Coefficients of
Diversity Experiences on Student Outcomes

Diversity Experience	Gen. Ed Gains	Personal/Social Gains	Institutional Satisfaction	Supportive Campus
Coursework	.172***	.162**	.074***	.064***
Interactional	.136**	.161***	.143***	.113***
Climate	.196***	.288***	.243***	.354***

(* p < .05, ** p < .01; *** p < .001)

To test the robustness of the influence of diversity experiences, all three diversity experiences were entered into the full models simultaneously and the resulting

standardized regression coefficients were compared. This method estimated whether one diversity experience (over another) had a stronger relative impact on the interested student outcome. Accordingly, this hierarchical approach helped to address the different development environments as described by Bronfenbrenner's Ecology Model. The standardized betas for each student outcome regressed on all three diversity experiences simultaneously are summarized in Table 5.2.

Table 5.2 Standardized Beta Coefficients of the Student Outcomes and Diversity Experiences

Diversity Experience	Gen. Ed Gains	Personal/Social Gains	Institutional Satisfaction	Supportive Campus
Coursework	.170***	.121***	.005	-.019
Interactional	.235***	.353***	.223***	.068**
Climate	.080***	.101***	.093***	.474***

(* = $p < .05$, ** = $p < .01$, *** = $p < .001$)

The results clearly imply that for the student outcomes of general educational gains, personal and social gains, and institutional satisfaction, the microsystem of interactional diversity had the stronger relative impact on the student outcomes followed by the mesosystem of coursework and macrosystem of climate for diversity. In one case for the institutional satisfaction outcome, the macrosystem of climate for diversity followed the microsystem of interactional diversity and then the mesosystem of coursework diversity. An important trend emerged from the data for the student outcomes of institutional satisfaction and supportive campus environment. The coefficient for coursework diversity fell out of statistical significance in full model. These results are important in that it suggests that this experience of diversity at the

mesolevel is less influential than either interactional (microlevel) or climate for diversity (macrolevel) for these student outcomes. For the supportive campus environment outcome, the macrosystem of climate for diversity had the stronger relative impact on this student outcome followed by interactional and then coursework diversity variable.

The collective results from the main effect models in this investigation supported the first research hypothesis that undergraduate students at Montana State University who more often engage in diversity experiences at the micro (interactional), meso (coursework) and macro (climate) levels report higher gains in college student outcomes than students who participate less often. The predicted results using the regression equations from the coefficients found in Tables 4.10., 4.14, and 4.18, revealed that students who participated at high levels of diversity scored higher on all student outcomes than those students who reported lower levels of diversity participation.

The findings were mixed for the second research hypothesis that stated undergraduate students at Montana State University who more often experience diversity at the macrolevel report lower gains in college student outcomes than students who more often engage in diversity at the micro and meso levels. For the three student outcomes of general educational gains, personal and social gains and institutional satisfaction, interactional diversity had the strongest relative impact of the three diversity experiences on these student outcomes. Climate for diversity which was described as an experience from the macrolevel environment had the most relative impact on the student outcome of supportive campus environment.

The results from the interaction models (gender x diversity experience) did not produce any statistical significant results in three of the student outcomes investigated. And despite observing a significant interaction coefficient for a supportive campus environment on climate for diversity x gender, the correlation was negative implying that the positive association between the diversity experience and supportive campus environment was less for women compared to men. Despite this finding, the overall results indeed suggested that the relationships between diversity experiences and self-reported college student outcomes do not vary between females and males in this investigation. Therefore, there is little evidence to support the research question that posited that female students at Montana State University who often engage in diversity experiences at the micro, meso, and macro levels report higher gains in college student outcomes compared to their similarly-engaged male counterparts.

The results from the interaction models that included race and ethnicity x diversity experience variables did produce statistically significant results in three out of the four student outcomes. However, most coefficients for the interaction terms were negative with one exception, Hispanic x climate for diversity and institutional satisfaction (see Table 5.3). Despite these findings, the overall results indeed suggested that the relationships between diversity experiences and self-reported college student outcomes do not vary between students of different race and ethnicity. Therefore, there is little evidence to support the research hypothesis that posited that students at Montana State University who are from traditionally under-represented groups on campus and who often engage in diversity experiences at the micro, meso and macro levels report higher gains

in college student outcomes compared to their similarly-engaged counterparts from traditionally represented groups.

Table 5.3 Significant Race and Ethnicity Interaction Terms with Student Outcomes

IV	Race	DV	Unstandardized b
Interactional Diversity Coursework	Asian	Supportive Campus	-.181*
Interactional Diversity Climate for Diversity	PNR	Supportive Campus	-.171*
Interactional Diversity	Hispanic	Institutional Satisfaction	.488*
Interactional Diversity	Other	Institutional Satisfaction	-.397**
Interactional Diversity	Asian	Personal and Social Gains	-.221*

(* = $p < .05$, ** = $p < .01$, *** = $p < .001$) Reference category = White

Discussion

Results from this investigation underscore the importance of students engaging in diversity experiences. And as a result of these experiences, positive gains on a number of college student outcomes were observed. Accordingly, findings of this investigation also suggest that those students who participate at high levels of diversity experiences, report higher gains in general education, personal and social development, a more supportive campus environment and greater satisfaction with the institution. These findings are consistent across all outcomes used in this investigation even after introducing a number of important student, family, and institutional controls. Recall the first research question that guided this investigation: what are the relationships between student's engagement in diversity experiences and student's self-reported college outcomes? The overall positive relationship of each diversity experience (coursework, interactional, and climate for

diversity) with each student outcomes (gains in general education, personal and social development, institutional satisfaction and supportive campus environment) corroborate the findings of several previous research investigations (Gurin, 1999; Gurin et al., 2002; Hurtado & Ponjuan, 2005; Pascarella et al., 1996; Umbach & Kuh, 2006; Villalpando, 2002; Zuniga, Williams & Berger, 2005). For clarity, further discussions of these results as it relates to the primary research question in this investigation are presented under the following headings: coursework diversity, interactional diversity and climate for diversity.

Coursework Diversity

As defined in this study, coursework diversity was operationally defined as the frequency to which an institution included diverse perspectives (different races, religions, genders, political beliefs, etc) in class discussion or writing assignments. This diversity experience approximates the mesosystem of a student as identified from Bronfenbrenner's Ecology Model. Coursework diversity by itself was positively related to all four student outcomes measured in this investigation. Students who are exposed to curriculums that are inclusive in knowledge of different races and ethnicities for example are thought to foster meaningful environments that support active thinking, intellectual engagement and social and civic development (Gurin et al., 2002; Nelson-Laird & Niskodé-Dossett, 2010).

Interestingly, and perhaps more importantly, the coursework diversity variable did not carry any weight versus the climate or interactional diversity measures in two of the student outcomes queried in this investigation. That is, the coursework diversity variable

fell out of statistical significance when all three diversity experiences were entered simultaneously into the regression analyses of supportive campus environment and institutional satisfaction regression models. These results are somewhat surprising given that interactions at the meso and micro levels are thought to be more influential on student development (Renn, 2003). The literature does suggest that certain types of diversity experiences may be more effective than others especially with its influence on cognitive skills and abilities (Bowman; 2010, Gurin et al. 2003). And, Umbach & Kuh (2006) charge that it is imperative for institutions that are less structurally diverse in their student body (as in the case with an institution like MSU) to look at coursework, curriculum, and campus events to help students cultivate skills necessary to work and live in a diverse society.

The lack of influence of coursework diversity when other measures of diversity are considered may be due to several situations or contexts. Bronfenbrenner (1979) posits that for development to take place, individuals must engage in complex actions with the right forces and resources present. Mesosystems are the interactions of two or more microsystems and represent for example the relations with peers and friendship groups, and or the relations of family experiences with college experiences. Special attention is focused on the synergistic effects created by the interaction (Renn; 2003). Micro and mesosystem environments of a student can conflict but development can still take place. That is, the coursework diversity experience may demand a certain type of academic response from the student. However, that same student may receive a competing message based on an informal interactional diversity experience at the

microlevel. As long as the student develops the skills necessary to analyze competing messages, development can occur. In contrast, if the student can not analyze the competing messages effectively, development may not take place. Results from this investigation may suggest that students at MSU are receiving competing messages in the classroom. Although more likely, other forms of diversity experiences on campus are probably lessening the impact of coursework diversity on student outcomes or even other types of learning experiences in and out of the classroom are influencing outcomes (i.e. participation in community projects and faculty interactions). The literature indeed reveals that strong student-faculty relationships are positively associated with a number of student outcomes (Pascarella & Terenzini, 2005 and references therein). The findings may also imply that students' are more resistant to challenges in their beliefs about institutional satisfaction and college campus environment but are less resistant when it comes to the student outcomes of educational and personal and social gains. Clearly more research in this area of inquiry is needed.

It is known from the literature that institutions with strong and clear diversity commitments have strong and positive associations with student perceptions of supportive campus environment and institutional satisfaction (Villalpando, 2002). Villalpando's (2002) study emphasized that students are most satisfied with their college experience and their institution when faculty promote multiculturalism and diversity both in and out of the classroom. As the findings in this investigation reveal, MSU is likely upholding its mission to improve diversity on campus by providing the necessary incentives and opportunities for students to become actively involved.

Interactional Diversity

Hurtado (2007) believes that “substantial and meaningful interaction” is the key to how diversity affects student outcomes positively (p. 190). Accordingly, Gurin et al. (2002) contend that students who interact more with people who hold different views other than their own will think and be challenged in novel ways that benefit student learning and improve student outcomes. Student exchanges with diverse people and student exposure to diverse perspectives and ideas in and out of the classroom are defined as interactional diversity experiences (Umbach & Kuh, 2006). This study found positive effects of interactional diversity on all student outcomes measured in this investigation. Again, interactional diversity approximates the microsystem of the student and was estimated by measures of interactional diversity, which include student exchanges with diverse people and exposure to diverse ideas, information and experiences. These results from this investigation are in line with the diversity literature (Bowman, 2010; Gurin et al. 2002; Hurtado, 2007; Pascarella et al., 1996; Umbach & Kuh, 2006).

The relevant findings of this investigation reveal that interactional diversity has a stronger relative impact on the three student outcomes of general educational gains, personal and social gains, and institutional satisfaction than coursework or climate for diversity experiences. In terms of the conceptual framework, the results are not surprising given that the microsystem is where most direct interactions with family, peers, friends, and teachers take place. However, given that MSU is a fairly homogeneous institution, and frequent interactions with someone from a different race for example are not as prevalent as would the opportunities on a campus with a more

heterogeneous student body, results may be surprising. The powerful debate that structural diversity is needed in the classroom and on campus in order for students to learn about group differences is somewhat challenged in this investigation. The argument refuting what affirmative action opponents advance-that the benefits of experiencing diversity can be achieved without the presence of ethnically and racially diverse peers is also challenged. An important limitation in this investigation was the type of interactional diversity experience the students actually had and how they identified it as an informal interaction. Interactional diversity as defined on the NSSE survey suggests it is exchanges with diverse people and exposure to diverse ideas, information and experiences. The question in broad strokes has varied interpretations and responses. While implied in the literature that informal interaction is usually an interaction with someone from a different race or ethnicity than your own, in this investigation and importantly, the interaction could be from an experience with someone who even had a different idea or thought.

With MSU students, the likelihood that these interactions were with someone from a different race or ethnicity were low. While it was important that the specific person-environment interaction happened, the relatively greater effect of interactional diversity versus the other forms of diversity experiences on certain student outcomes in this investigation could be that the “quality” of the informal interaction student have outweighs the number, frequency, or type of experience (Chang, 1996).

Some researchers found conditions for improving informal interactional diversity on campus and advance that a more racially diverse student body and more opportunities

for students to live and work on campus are what is needed for improvement (Chang, Astin, & Kim, 2004). However, in a follow-up study, Chang, Denson, Sáenz, & Misa (2006) suggest that improving institutional culture and climate which included “altering the legacy of exclusion, the organizational structure, and the psychological and behavioral climate of the campus” (pg. 433) were keys to understanding how students really benefit not only from interactional diversity but from all types of diversity experiences. Obviously, achieving structural diversity among the student body results in more opportunities for students to interact and learn from one another different from themselves (Hurtado et al., 2003) but it is also not a guarantee. And as reported in the literature, the single most influential predictor of college satisfaction and campus climate and support has been described as an institution’s commitment to transforming the campus and all aspects of its environment to a strong diversity emphasis (Gurin et al., 2002; Hurtado, 1999; Nelson-Laird & Niskodé-Dossett, 2010). This suggests that diversity experiences at the macrosystem level are critical to the college student experience. This line of thinking is further discussed in the next section.

Climate for Diversity

The macrosystem of a student was estimated by measures of climate for diversity which included if the institution encourages contact among students from different economic, social, and racial or ethnic backgrounds. As with coursework and interactional diversity findings, results from this investigation reveal the climate for diversity variable was a positive and significant predictor of all the student outcomes.

These findings are also supported in the literature (Gurin et al.; 2002; Umbach & Kuh, 2006).

Importantly, individual perceptions of the campus climate can affect retention, persistence and graduation rates of all students but specifically can have more detrimental effects on minority students (Hurtado & Ponjuan, 2005). Classroom and campus perceptions can also affect student's academic performance, their interaction with faculty, their social experiences and commitment to an institution (Nora & Cabrera, 1996). Park (2009) reported that student's perceptions of diversity, an institution's historical record on racial discrimination, informal interactional diversity, and structural diversity can all affect a student's perception of supportive campus environment.

A key finding in this study was the greater relative impact of the macrosystem climate for diversity experience versus other diversity experiences on the supportive campus environment outcome. This suggests institutional policies and programs at MSU in part are working, although it is not clear if these policies and programs work effectively for all student groups on campus (see interaction section below). It is well supported in the literature that institutions that have curriculum in place, programs that support and offer recruitment, retention and graduation opportunities to diverse student groups and whose institutional mission reinforces diversity, positively shape how students perceive their campus environment (Pascarella & Terenzini, 2005; Villalpando, 2002). Drawing attention to this type of diversity experience and at the macrolevel provides a powerful means to understand the importance of the effects of even environments that students are not physically part of. Student's ideas about a supportive

campus environment as culled from their culture, their families, and their institution affects how they view a supportive campus environment. Several macrosystem influences on multiracial identity development have been reported by Renn, (1999) with the understanding that interactions with meso and microlevel environments formed key elements in a student's macrosystem ecology. In this investigation, given the fact that interactional diversity was also a significant predictor of supportive campus environment indicates how important interactions at the microlevel environment were in figuring out what a supportive campus environment means to a student at the macrosystem level.

The following section discusses the findings of both interaction research questions which are presented under the following sub-headings, diversity experiences and gender, and diversity experiences and race/ethnicity.

Diversity Experiences and Gender

To reiterate, information gleaned from this investigation reveal that diversity experiences at MSU were positively associated with the student outcomes of general educational gains, personal and social gains, institutional satisfaction and supportive campus environment. The relationships were apparent even after a set of control variables were introduced into the full model. To extend this line of research, the present study also investigated the conditional effects of diversity experiences on student outcomes. To this end, the second research question queried to what extent do the relationships between diversity experiences and self-reported college student outcomes vary between females and males?

The results from this area of analyses found that the relationship between the diversity experiences and the student outcomes did not vary between females and males. Although one interaction term did reach statistical significance (climate for diversity and supportive campus environment, $b = -.063$, $p < .05$). This negative interaction indicates that the positive association between climate for diversity and supportive campus environment was significantly smaller for females when compared to their male counterparts. Although the correlation coefficient is not particularly strong, this finding does raise some concern and may suggest that practices and policies of diversity at MSU at least at the meso-level may be more influential for males than females. However, the lack of any real trends in the results may temper this statement somewhat.

The studies examining gender have presented inconsistent or mixed findings depending on the student outcomes measured. For example, some studies have found a less supportive campus for women while other studies have found no gender differences at all on a number of student outcomes (Drew & Work, 1998; Nelson-Laird & Niskodé – Dossett, 2010; Pascarella & Terenzini, 2005; Whitt, Edison, Pascarella, Nora, & Terenzini, 1999). Despite not observing consistent interaction trends in this investigation, there have been studies which revealed that gender can have a significant influence on critical thinking skills, attitudes and beliefs, and educational attainment and persistence (Pascarella & Terenzini, 2005). More research is still needed in this area for several reasons. Knowing which type of diversity experience are most effective for the different genders could help to improve a number of support services, programs, and centers on campus aimed at diversity issues (Nelson-Laird & Niskodé – Dossett, 2010)

Findings could also help improve diversity courses and multicultural classes taught on college campuses today.

Diversity Experiences and Race and Ethnicity

The third research question addressed in this investigation asks, to what extent do the relationships between diversity experiences and self-reported college student outcomes vary between race and ethnicity? Differences among groups reveal significant interaction effects for the outcomes of supportive campus environment and institutional satisfaction and one significant interaction effect in student's personal and social gains. All effect sizes however, were modest and no consistent trends were observed. It is interesting that both supportive campus environment and institutional satisfaction are the outcomes in the majority of statistically significant results but perhaps expected since racial and ethnic differences in students' perceptions of their campus environment and institutional satisfaction have been reported extensively in the literature (Cureton, 2003; Pascarella et al., 1996; Gurin et al., 2002; Nelson-Laird & Niskodé-Dossett, 2010).

An interesting and relevant finding in this investigation was the positive and statistically significant result that the positive association between climate for diversity and institutional satisfaction was greater for the Hispanic population of students than compared to White students at MSU. Previous studies portray a much more negative association with this student group and a number of student outcomes than when compared to their White counterparts or other racial and ethnic groups (Hernandez, 2002; Hurtado, Carter & Spuler, 1996; Nora & Cabrera, 1996). For example, Latino students who perceive a hostile campus climate have more difficulty with adjusting to the college

environment academically, socially and culturally (Hurtado, Carter & Spuler, 1996).

However, it appears that some kind of participation in a diversity experience ameliorates any adverse affect on student outcomes. Hurtado and Ponjuan (2005) report that Latinos who participate in diversity activities through specific diversity events in and out of the classroom or had positive interactions with diverse peers have a higher sense of belonging at college than those peers who did not participate in the diversity activities. Strayhorn (2008) report similar findings for both Black and White male students in his study.

Recall that climate for diversity was identified as a macrosystem experience in the conceptual framework in this investigation. The macrosystem is defined by historical trends and events, cultural expectations, and social forces (Renn, 2003). Cultural understanding of race, gender and ethnicity are also representative of a macrosystem (Renn & Arnold, 2003). It may be that the positive association between climate for diversity and institutional satisfaction was greater for the Hispanic population of students than compared to White students because Latinos draw more meaningful information from their culture and rely more on their cultural expectations to make informed decisions than White students in this investigation (Hurtado & Ponjuan; 2005). Future research should extend this line of thinking and focus on the influence of climate for diversity with additional educational outcomes.

It seems unlikely that the positive associations between interactional diversity and supportive campus environment or interactional diversity and institutional support was experienced less for Asians and the Others group (than compared to White) in this

investigation because of an increase in the diversity of the student body. Pike and Kuh (2005) found at some institutions informal interaction was positively associated with the diversity of the student body but negatively related to perceptions of the campus climate and perceived institutional support. The researchers concluded that increasing the diversity of the student body may in fact reduce rather than improve the outcome variable, openness to diversity. It is likely the findings in this study suggest or point to an institutional policy or program that still retains the structure and practices that reflect and serve predominantly White students. Actively engaging students in diverse interactions that benefit all student groups is a tall task for any institution. However, it is imperative that an institution's network of values, policies, practices and resources address these influences to establish and sustain a positive campus environment. Certainly more research is needed in this area in order to understand how different students successfully function within the university environment. The following sections present the limitations of the study and recommendations for future research.

Limitations of the Study

This study analyzed student responses from the NSSE survey in 2007 and 2008. Results may differ in unknown ways if other years of the NSSE survey were analyzed. Accordingly, student characteristics, diversity measures, and student outcomes were based on the responses of both freshman and seniors at MSU. It is not known how students who classify themselves as sophomores and juniors would respond to the survey. The number of respondents in the different race and ethnic categories compared to White

students were relatively small as well. Despite this it was important to retain as many different student groups for this investigation. All measures of diversity experiences and the student outcomes used in this investigation were defined by the literature that specifically addressed the NSSE survey. Secondary analyses of this kind can be constrained by measurement choices previously made by other research investigators (Strayhorn; 2008) For example, it is well known that interactional diversity may be defined differently depending not only on the instrument used in the investigation but from the multiple perspectives diversity brings meaning to and how diversity is defined. Nonetheless, the measures and statistical analyses used in this study were sound and are accepted within the field. Thus, the findings should also be regarded as similarly sound.

The results of this investigation are from a single institution therefore findings can only be generalized for this institution. It is unclear how other institutions would respond to the NSSE survey. But, it is reasonable to assume that the findings could be generalized, in part, to institutions that share similar characteristics to those of MSU. Another limitation in this study is related to the validity of self-reported student gains. Literature has informed the validity and credibility of student's self report dating back as early as the 1970s (Kuh, 2003). Many researchers have investigated issues that may confound self reports, such as memory, recall, and the passing of time (see Pike & Kuh, 2006 and references therein). However, Kuh (2003) reviewed the validity, reliability, and credibility of self-reports and issued the following:

Self reports are likely to be valid under five general conditions. They are: (1) when the information requested is known to the respondents; (2) the questions are phrased clearly and unambiguously; (3) the questions refer to recent activities; (4) the respondents think the questions merit a serious and thoughtful response; and

(5) answering the questions does not threaten, embarrass, or violate the privacy of the respondent or encourage the respondent to respond in socially desirable ways. (p. 4).

Studies have indicated that the NSSE meets the criteria as stated above (Kuh, 2009; Pike, 2006; Pike & Kuh, 2005) and findings from these studies and from the present investigation offer meaningful information on college student engagement in diversity experiences. The following sections address the recommendation for this investigation.

Recommendations for Future Practice

A compelling debate remains whether an increase in diversity experiences serves an important function for college students, education, and institutions. If the answer is “yes,” then institutions must consider and measure the importance of diversity policies, programs, and resources as they move forward to meet the needs of an ever-changing student body. Findings in this investigation support the literature that interactional diversity is important to positively affect student outcomes (Denson & Chang, 2009; Gurin et al., 2002; Huh & Kuh, 2003). With this information, students should have numerous opportunities during their collegiate careers to discuss, discover, and compare differences among themselves. Whether these events are to take place during classroom exercises, dorm meetings or planned events on campus, the value of exchanging different ideas should help students look at perspectives different from their own. It is up to faculty, student affairs leaders and student leaders to help bridge the gap across group differences. Harper (2009) found that race-conscious student engagement practices implemented in the first year of college resulted in students perceiving more positively

about their interactions with faculty and about a supportive campus environment.

Accordingly, students were more likely to participate in service learning projects and study abroad events.

Findings in this investigation also captured the impact of coursework diversity on institutional satisfaction and supportive campus environment. Faculty may need to communicate specifically to students what diversity in their classrooms mean and accordingly determine if their teaching practices and curriculum are linked to diversity experiences-especially knowing that interactional diversity has a powerful impact on a number of student outcomes. It is also well known from the literature that both in-classroom and out-of classroom student-faculty interactions have net positive effects on student's educational development (Pascarella & Terenzini, 2005). Thus, faculty who incorporate these types of interactions and pursue instructive insight from colleagues or even seek out information from other institutions that have effective diversity programs may foster a stronger sense of equity for all types of students in their classroom (Harper, 2009).

Results from this investigation also revealed that the positive associations between interactional diversity and supportive campus environment and between interactional diversity and institutional satisfaction were differentially experienced by some student groups on campus compared to their White counterparts, although no consistent trends were apparent. Hurtado et al., (1998) stated the "psychological dimension of the campus racial climate involves individuals' views of group relations,

institutional responses to diversity, perceptions of discrimination or racial conflict, and attitudes toward those from other racial/ethnic backgrounds than one's own” (pg. 289) Institutions that become “deliberate agents of socialization” (Hurtado et al., 1998, p. 290) where for example, campus leaders insure that the perspectives of all members of the institutional community be considered in decision-making processes, implement campus-wide activities that stimulate interest for all groups on campus, support culturally diverse student organizations on campus, and insure that students perceive the institutional climate as fair and just are necessary vectors to improve campus environments. Further recommendations of future practices follow:

- Findings support what is well documented in the literature: diversity in higher education matters. It is important for higher education leaders to create institutions that are microcosms of the equitable and demographic society we aspire to become (Gurin et al, 2002).
- As with other investigations, findings from this investigation indicated curricular initiatives of diversity, opportunities for diverse peer interactions, and an institution’s encouragement can foster active and critical thinking (Hu & Kuh, 2005, Pascarella & Terenzini, 2005, Gurin et al. 2002). Institutions need to continue to maximize diversity features that facilitate this type of student development.
- Climate for diversity as measured in this investigation was the extent to which the institution encouraged contact among students from different economic, social, and racial or ethnic backgrounds. The extent to which institutions can convey to

their students that they value such diverse interactions will certainly have an impact on the environment and racial climate of the campus.

- Interactional diversity (micro) in this investigation had a stronger relative impact over other diversity measures on three of the student outcomes (general education, personal and social gains, and institutional satisfaction). Substantial and meaningful interaction is the key to how diversity affects student outcomes (Hurtado et al, 2002). The literature affirms that students who participate in diversity workshops and cultural events sponsored by the institution have increased learning outcomes (Huh & Kuh, 2003; Kuh, 2005; Terenzini, Cabrera, Colbreck, Bjorklund, & Parente, 2001). Students who experience cross-racial interactions are more likely motivated to reduce their own prejudices and biases and work toward social justice issues for all types of students on campus (Zuniga, Williams & Burger, 2005). Therefore, institutions that continually provide students with ample opportunities for informal interaction likely demonstrate a commitment and interest to their students about diversity issues.

Recommendations for Future Research

The findings of this investigation also reveal that there is much more research that needs to be done in order to understand and fully appreciate the effects of how diversity experiences influence students' outcomes. Future research should extend the results in a number of important areas.

- More research is needed on student's predisposition to diversity experiences prior to entering college. An example of a research question would be: Are students living in an urban area before college more likely to seek out diverse situations in college than those students who grew-up in a rural area?
- More research is needed on student's precollege characteristics to determine what types of pre-college characteristics may have more of an impact on diversity experiences and if any additional proxies of student characteristics that may be relevant to the student outcomes. An example of a research question would be: Does high-school curriculum impact student diversity experiences in college?
- More qualitative research to support the quantitative inquiry results is warranted. Specifically understanding the quality of diverse interactions students have would most certainly help to develop a more comprehensive understanding of interactional diversity and its effect on student outcomes. An example of a research question would be: What is the relationship between the quality of the informal interactional diversity and student outcomes?
- More research is needed to determine specifically the impact of classroom diversity on student outcomes while controlling for other forms of diversity experiences. This line of inquiry may also reveal the extent faculty optimize their classrooms for diversity. An example of a research question would be: To what extent do faculty involved in developing diversity experiences in the curriculum, impact student outcomes?

- More research to further understand the relationship of diversity experiences on a supportive campus environment is needed. Perceptions of a supportive campus imply both an institutional and student components. An example of a research question would be: Do student's perception of a supportive campus environment differ by diversity experience?
- More research to answer the research question: What brings males and female students closer on student outcomes measures as a result of the diversity experiences? This line of research could complement continuing lines of inquiry into the revealing differences.
- More research to answer the research questions: What brings racial and ethnic groups closer on measures of student outcomes as a result of the diversity experiences? This line of research could complement continuing lines of inquiry.

Conclusions

This study affirms past work on the influence of diversity experiences on select student outcomes and offers additional support that indeed diversity experiences are important to the educational mission in higher education. This study theoretically furthers the body of existing literature as the findings reveal that coursework diversity and all that this variable encompasses may not be as influential when other diversity experiences are available to the student. Chang's (1999) work in part supports this finding. As a result, a key implication for this finding points towards an institution's charge to provide and improve support services, resources, and education in diversity

issues for all types of students. The literature affirms that students who do participate in diversity workshops and in cultural events sponsored by the institution have increased learning outcomes (Huh & Kuh, 2003; Kuh, 2005; Terenzini, Cabrera, Colbreck, Bjorklund, & Parente, 2001). Accordingly, students who participate in diversity courses and who experience cross-racial interactions are more likely motivated to reduce their own prejudices and biases and work toward social justice issues for all types of students on campus (Zuniga, Williams & Burger, 2005).

The findings from this investigation also suggest that some racial and ethnic groups do experience diversity differentially albeit somewhat modestly. Thus, even at a fairly homogenous institution like MSU, it is clear that it is the institution's responsibility to bring *all* students groups closer together in every aspect of a successful college experience. This statement should hold for all student groups regardless of their numbers or representation on campus.

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APPENDICES

APPENDIX A

NATIONAL SURVEY OF STUDENT ENGAGEMENT

National Survey of Student Engagement

Instruments to measure forms of student engagement have been around as early as the 1970s. The College Student Experiences Questionnaire (CSEQ) developed by C. Robert Pace and later the Cooperative Institutional Research Program's Entering Student Survey and the College Senior Survey were national surveys primarily created and designed for research purposes according to Kuh (2009) and not intended for institutional accountability and improvement. The time to administer and complete many of these surveys contributed to low student response rates in recent years (Kuh, 2009). The need for good data to drive improvements in teaching and learning and to "authenticate evidence of student learning and effective educational practice" were the desires of many visionaries for educational reform in the early 1990s (p. 7, Kuh, 2009). It was the vision of Russ Edgerton who directed education programs at the Pew Charitable Trusts along with Peter Ewell of the National Center for Higher Education Management Systems that developed what is now known as the National Survey of Student Engagement (NSSE, Kuh, 2009). The NSSE was created to help assess good educational practices and what students gain from their college experiences.

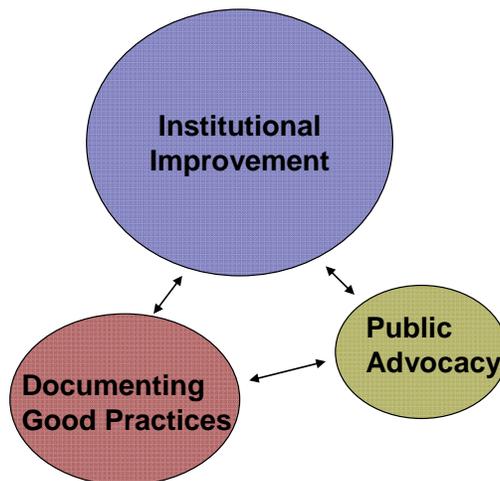
The NSSE has been used to measure the extent to which students are engaged in educational practices and what they gain from their college experience. These educational practices have been linked to learning, student development and desired college outcomes (National Survey of Student Engagement Institutional Report, NSSE-IR 2008). As an example of the survey's widespread and growing interest, in 2008,

approximately 480,000 students from 769 higher education institutions in the United States and Canada completed the survey. The institutions participating in NSSE reflect the diversity of today's higher education institutions.

NSSE's Purpose

The NSSE is founded on three core purposes that are continued today: institutional improvement, documenting good practices and public advocacy. The importance of each core is illustrated by size of the balls in the diagram below (Kuh, 2009). The most important purpose is to provide high quality data to an institution that in

NSSE Core Purposes (adapted from Kuh, 2009)



return can use the data to improve upon on the undergraduate student experience. The second purpose of the NSSE is to learn about and document effective educational practices in higher education. Through the continuous analyses of NSSE results and through additional and complementary research activities and practices undertaken at the NSSE Institute for Effective Educational Practice (Kuh, 2009), the NSSE devotes its time to better understand factors associated with student engagement. The third core purpose

is to publicly reporting the findings from NSSE. Such information may help students to make informed decisions about the institution they are considering and can inform institutions about peer institutions, national benchmarks and collegiate quality.

NSSE Structure

The NSSE instrument is administered electronically and annually in the spring of each academic year. Previous versions of the instrument were administered by paper as well. The NSSE instrument collects student responses in five main categories: (1) student behaviors, (2) institutional actions and requirements, (3) reactions to college, (4) student background information, and (5) student learning and development (<http://nsse.iub.edu/>). In the first main area, students are asked to respond to questions concerning participation in educationally purposeful activities. This category includes questions that relate amount of time they interact with professors and peers, study, and are involved in co-curricular and employment opportunities. In the second category, students respond to a set of questions on what the institutions academically requires of them. Students respond to a set of questions about college environment in the context of achievement, college satisfaction, and persistence in the third main category of the NSSE and in the fourth main area, a set of demographic and descriptive questions are asked in order to provide information on the college experience among different groups of students on campus. In the last main category, students respond to questions estimating their educational and personal growth in such areas as general knowledge, oral and written communication and personal and social development (Kuh, 2001).

As described extensively on the NSSE website (<http://nsse.iub.edu/>) and in the literature (Kuh, 2001; Kuh, 2003; Kuh, 2009; Pike, 2006), a framework and common language for discussing and reporting NSSE results was needed. The creation of five NSSE benchmarks of good educational practices followed (<http://nsse.iub.edu/>). The benchmarks: level of academic challenge, active and collaborative learning, student-faculty learning, enriching educational experiences and supportive campus environment are based on 42 questions from the NSSE that capture student's institutional experience. The benchmarks are used extensively to measure student engagement and institutional performance. Pike (2006) accordingly developed twelve scalelets or groups of questions on similar topics from the NSSE that increased the explanatory power of the benchmarks. The scalelets are further explained in the next chapter.

Reliability and Validity of the NSSE Instrument

Because the NSSE instrument relies on student self-reports, two major problems can arguably question the reliability and validity of the instrument: students may not provide accurate information in response to a question and, students may be unwilling to provide truthful information in response to a question (Kuh, 2003). Extant literature has informed the validity and credibility of student's self report dating back as early as the 1970s (Pace, 1985 and references therein; Kuh, 2003 and references therein). While many of the researchers have investigated issues that confound student's self reports: memory, recall, halo effects and time passed for example, Kuh, (2003) in his review on the validity, reliability and credibility of self-reports stated the following:

Self reports are likely to be valid under five general conditions. They are: (1) when the information requested is known to the respondents; (2) the questions are phrased clearly and unambiguously; (3) the questions refer to recent activities; (4) the respondents think the questions merit a serious and thoughtful response; and (5) answering the questions does not threaten, embarrass, or violate the privacy of the respondent or encourage the respondent to respond in socially desirable ways. (p. 4).

The NSSE was intentionally designed to satisfy all of the five general conditions stated above (Kuh, 2003). Importantly, items on the NSSE have been used in other well-regarded student research programs as the Cooperative Institutional Research Program at UCLA and College Student Experiences Questionnaire Research Program at Indiana University (Kuh, 2003).

NSSE examined the reliability of the survey through test-retest analysis at the student level and stability analysis at the institutional level (NSSE, Institutional Report, 2008). NSSE conducted test-retest analyses on students who completed the survey twice during the same year and found reliability coefficients ranging from 0.74 to 0.78 for each of the benchmarks in 2002. Similar reliability coefficients were observed for a different group of students in 2005 (NSSE, Institutional Report, 2008). These results suggest that little variation in student responses exists regardless of the testing period. Stability of institutional scores from one year to the next year was measured at 214 institutions who took the NSSE survey in 2002 and 2003 and again at 236 institutions that completed the survey in 2004 and 2005 (NSSE, Institutional Report, 2008). Results unequivocally demonstrated institutional NSSE data were stable from year to year. A more comprehensive summary of the validity and reliability of the NSSE can be found at the NSSE website (www.nsse.iub.edu).

Despite the efforts of NSSE constituencies to insure the reliability and validity of the NSSE instrument, the survey's validity has come under criticism. Stephen R. Porter, a professor of research and evaluation at Iowa State University, argued that the "NSSE asks many questions that are of dubious relevance, are too vague for the answers offered by students to be meaningful, or fail to take into account shortcomings in human memory and the difficulties involved in precisely measuring attitudes" (Schmidt, 2009; The Chronicle of Higher Education Nov 7th, pg 1). Porter further added that "many of its (NSSE) questions use words that are open to varying interpretations or ask students to report the frequency of behaviors on scales using vague quantifiers, such as "often," rather than actual numbers (Chronicle of Higher Education pg. 1). Porter (2009) suggests that educational researchers should have "more rigid criteria for judging whether survey questions are valid" (pg 1) and further adds that "instead of trying to measure student engagement through survey questions asking them how often they engage in certain activities, education researchers should borrow from other fields, such as economics, and ask students to keep daily diaries in which their accounts of how they spend their time will be less prone to memory lapses and thus more accurate" (pg. 1).

However, recent empirical findings in support of the NSSE, was reported by Pascarella, Seifart and Blach (2010). These researchers analyzed institution-level data from the first year of the Wabash National Study of Liberal Arts Education to estimate the validity of the NSSE benchmarks in predicting outcomes of a general liberal arts education. Nineteen institutions from 11 different states participated in the investigation. Data were collected from first-year students entering college in the fall of 2006 and again

at the end of their first year of college in early spring 2007. Students also completed a seven-item liberal arts outcome measures. In the follow-up data collection in spring 2007, the same students completed the National Survey of Student Engagement and the posttests of the liberal arts outcome. Pascarella et al. found institution-level NSSE benchmark scores had a significant overall positive association with the seven liberal arts outcomes. The most influential NSSE benchmark appeared to be the Enriching Educational Experiences scale, which had significant associations with the three outcomes, effective reasoning and problem-solving, moral character, and intercultural effectiveness. Correlations with the NSSE Supportive Campus Environment benchmark and intercultural effectiveness, and personal well-being were reported. The Level of Academic Challenge benchmark had significant partial associations with critical thinking and the inclination-to-inquire and lifelong-learning. The Active and Collaborative Learning benchmark had a significant partial correlation with intercultural effectiveness. Although their investigation was limited to 19 institutions that participated in the study, the researchers nonetheless concluded that NSSE scores can be reasonable proxies for student growth and learning across a range of educational outcomes. Other investigations have supported the use of NSSE as a reliable and valid instrument to measure the extent to which students are engaged in educational practices and what they gain from their college experience (Hu & Kuh, 2003; Kuh et al., 2005; Pike, 2006; Umbach & Kuh, 2006). As evidenced from the NSSE website, research on the reliability and validity of the survey remains ongoing.

Concluding Remarks on the NSSE

Colleges and institutions are expected to be accountable for the quality of undergraduate education. The urgency for institutions to demonstrate that they provide a high-quality education for their students is apparent. And while several college-experience surveys are acceptable to demonstrate institutional accountability, none reach the number of students as the NSSE (Pascarella et al., 2010). The NSSE has been completed by nearly 1.5 million students at nearly 1,200 colleges and universities in the last decade. In 2009 alone, 643 different colleges and universities participated in the survey (www.nsse.iub.edu). In this context, it appears that many institutions are committing to a strategic plan of improvement and assessment as measured by the NSSE. According to Kuh (2001) “its long term success depends on the continued cooperation and forward-looking readers like presidents, deans, and institutional researchers who stepped out in front to involve their schools in NSSE” (p. 66).

APPENDIX B

NSSE SURVEY ITEMS CONTRIBUTING TO THE INDEPENDENT VARIABLES

NSSE Survey Items Contributing to the Independent Variables

Variable	Survey Questions	Response Sets/Coding
<i>Independent</i>		
Sex	What is your sex?	0= Male; 1= Female
Race/Ethnicity	What is your racial or ethnic identification?	Dummy coded to the following: White (1 = yes; 0 = no), Native American (1 = Yes, 0 = no), Asian (1 = yes; 0 = no) Hispanic (1 = yes; 0 = no) Other (1 = yes; 0 = no) or Prefer Not to Respond (1 = yes; 0 = no).
Year in School	What is your current classification in college?	1= First Year; 2 = Senior;
Interactional Diversity	-Had serious conversations with students of different race or ethnicity other than your own -Had serious conversations with students who differ from you in terms of their religious beliefs, political opinions or personal values	1= never, 2= sometimes, 3 = often and 4 = very often
Coursework Diversity	- Included diverse perspectives (different races, religions, genders, political beliefs, etc) in class discussions or writing assignments	1= never, 2 = sometimes, 3= often and 4 = very often
Climate Diversity	- Encouraging contact among students from different economic, social and racial or ethnic Backgrounds	1 = little, 2 = some, 3= quite a bit, 4= very much

NSSE Survey Items Contributing to the Dependent Variables

Variable	Survey Questions	Response Sets/Coding
<i>Dependent</i>		
Institutional Satisfaction	<ul style="list-style-type: none"> - How would you evaluate your entire educational experiences at this institution? - If you could start over again, would you go to the same institution? 	<p>1 = poor, 2= fair, 3 = good, and 4 = excellent</p> <p>1 = definitely no, 2= probably no, 3= probably yes, and 4 = definitely yes (responses were converted to z-scores)</p>
Gains in Personal and Social Development	<ul style="list-style-type: none"> - To what extent has your experiences at this institution contributed to <ul style="list-style-type: none"> ▪developing a personal code of values and ethics ▪improving the welfare of your community ▪understanding yourself ▪working effectively with others ▪voting in local, state or national elections ▪developing a deepened sense of spirituality ▪understanding people of other racial and ethnic background 	<p>1 = very little, 2= some, 3= quite a bit, 4= very much.</p>
Gains-General Education	<ul style="list-style-type: none"> - To what extent has your experiences at this institution contributed to <ul style="list-style-type: none"> ▪acquiring a broad general education ▪writing clearly and effectively ▪speaking clearly and effectively ▪thinking critically and analytically 	<p>1 = very little, 2 = some, 3= quite a bit, 4= very much.</p>

NSSE Survey Items Contributing to the Dependent Variables

Variable	Survey Questions	Response Sets/Coding
<i><u>Dependent</u></i>		
Supportive Campus Environment	-To what extent does your institution emphasize <ul style="list-style-type: none"> ▪providing the support you need to succeed academically? ▪helping you cope with you non-academic responsibilities? ▪providing the support you need to thrive socially? 	1= very little, 2 = some, 3 = quite a bit, 4 = very much

APPENDIX C

CORRELATION MATRIX OF THE INVESTIGATION VARIABLES

Correlation Matrix of the Investigation Variables

	CW DIV	CLIM DIV	IADIV	ED GAINS	PS GAINS	SUPPT CAM	INST- SATISF	RACE	LIVE	FATHR EDU	MOTHR EDU	FAC IDEAS	COM- PROJ
CW-DIV	1												
CLIM-DIV	.247	1											
IA-DIV	.376	.224	1										
ED-GAIN	.270	.299	.226	1									
PS-GAINS	.305	.457	.294	.594	1								
SUPPTCAM	.172	.550	.215	.416	.562	1							
INSTSATISF	.108	.265	.161	.458	.399	.436	1						
SEX	-.159	-.095	-.022	-.052	-.102	-.059	-.026						
RACE	.041	-.034	.086	-.030	-.047	-.068	-.053	1					
LIVE	-.039	-.162	-.049	.071	-.051	-.192	-.192	.026	1				
FATHREDU	-.001	.042	.058	-.028	.015	.036	.056	.036	-.094	1			
MOTHREDU	.027	-.036	.038	-.038	.005	.025	.032	.058	-.113	.498	1		
FACIDEAS	.195	.207	.302	.242	.298	.249	.129	.018	.054	.021	.025	1	
COM-PROJ	.210	.126	.187	.152	.281	.141	.070	.007	.073	.017	.001	.254	1

