

**MARYWOOD UNIVERSITY  
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT**

Nonresponse Bias in Student Assessment Surveys: A Comparison of Respondents  
and Non-Respondents of the National Survey of Student Engagement  
at an Independent Comprehensive Catholic University

by

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## ABSTRACT

### Nonresponse Bias in Student Assessment Surveys: A Comparison of Respondents and Non-Respondents of the National Survey of Student Engagement at an Independent Comprehensive Catholic University

Based upon the theoretical framework of social foundations inquiry, with engagement as both process and product of the educational process, a quantitative study measured nonresponse bias of first-year undergraduate students in the National Survey of Student Engagement (NSSE) 2004, at one participating NSSE university, an independent comprehensive Catholic university in northeastern Pennsylvania. This assessment tool was developed by higher education professionals to measure engagement as a proxy indicator for undergraduate student learning and development outcomes. Unfortunately, average response rates for the NSSE have been in the low 40 percent range. In such a situation, external validity of the survey results is in question. Therefore, nonresponse bias needs to be measured as an integral part of survey research.

The survey administration was conducted, over approximately a 40-day period, in a multi-stage follow-up process with personal appeals to the subjects. The study tested the research hypotheses by comparing the results of the five NSSE engagement scales and seven student socio-demographic variables using independent sample *t*-tests and chi-square goodness-of-fit statistical tests. Additional statistical analyses were performed to investigate the comparison of individual survey items that make up the engagement scales, as well as additional items not part of the engagement scales.

Comparative analyses indicated the study respondents were representative of the university non-respondents in terms of race, major of study and first-year grade point average, but not for gender and first-year place of residence. Results for Research

Hypothesis One suggest that there is no significant difference between NSSE 2004 first-year respondents and first-year non-respondents on the seven socio-demographic variables. Results for Research Hypothesis Two suggest that there was no significant difference between the two groups on four of the five NSSE National Benchmarks of Effective Education Practice (engagement scales): Level of Academic Challenge, Active and Collaborative Learning, Enriching Educational Experience, and Supportive Campus Environment. However, study results suggest that there was nonresponse bias on the Student-Faculty Interaction Scale and that the non-respondents might be more engaged on the activities questioned by this scale than the respondents. Additional micro-level analyses of individual survey items, both those associated with the engagement scales and those not, indicated a presence of nonresponse bias on numerous items. Several items indicated that non-respondents were more engaged, but most indicated that the non-respondents were less engaged than the respondents. Implications of these findings and recommendations are offered for the scholarship of student assessment.

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## CHAPTER ONE

### Introduction

“A low response rate inevitably renders a piece of research fair game for reviewers who attack the finding, conclusions, generalizability, and, occasionally, the judgment and morality of the author” (Hogan, 1985, p. 17).

#### *Statement of the Problem*

A major concern in survey research has always been a low response rate and possible nonresponse bias in survey data (Boser, 1988; Groves, Dillman, Eltinge & Little, 2002; Porter, 2004a; Reuss, 1943; Rogelberg & Luong, 1998). For purposes of this research, nonresponse bias is defined as a bias that exists in the results when respondents to a survey are different from those who did not respond in terms of demographic or attitudinal variables, or other variables relevant to the survey topic (DDS Research, Inc., 2004).

Consequently, for survey research, “the problem of nonresponse poses a threat to the external validity of survey conclusions” (Viswesvaran, Barrick, & Ones, 1993; p. 551). In other words, conclusions cannot be used to generalize about the population studied. Survey results are subject to nonresponse bias when there is a systematic difference between those who responded and those who did not respond to a survey (DDS Research, Inc., 2004). Both respondents and non-respondents to surveys (i.e., the original sample of the research population) need to represent the entire population under consideration, when the data collected are used to generalize about the population.

A review of survey literature, provided in Chapter Two, shows that since response rates in surveys are decreasing (Groves, Dillman, et al., 2002; Porter, 2004a; Schwarz, Groves & Schuman, 1998; Smith, 1995; Steeh, 1981), the validity and generalizability of

low respondent rates is a major concern for survey administrators. Throughout the literature, survey non-respondents often tend to differ from respondents on features significant to the purpose of the study (West, 1991). This is not as serious a problem in the fields of public and non-profit administration, where it is common for government surveys' response rates to be over 90 percent, as it is in non-governmental surveys which achieve about 75 percent (Tanur, 1994).

In contrast, nonresponse bias in the field of education has had a different history. As far back as the 1960s, researchers measured nonresponse bias (Thistlethwaite & Wheeler, 1965) when administering surveys. In the 1970s, a pioneer in the higher education improvement movement, Alexander Astin, identified nonresponse bias as the "principal methodological limitation of the mailed questionnaire," (Astin, 1970b, p. 446). Other researchers in education, during the same decade, thought that only a response rate from about 85 percent and preferably in the 90 percent range "requires no further action and permits the assumption of representativeness and, in turn, of credible findings" (Kerlinger, 1973, p. 414). However, higher education survey response rates, in recent years, have decreased to percentages below those previously acceptable for representativeness and credibility purposes (Dey, 1997; Sax, Gilmartin, & Bryant, 2003). For example, Dey (1997), based on national longitudinal surveys by the American Council on Education and the Cooperative Institutional Research Program (CIRP), reports declining response rates over a thirty year period since the early 1960s, from a high of 65% to 21%.

At the same time, while student survey response rates are decreasing, the number of student assessment surveys is on the rise (Porter, Whitcomb, & Weitzer, 2004).

Starting in the 1960s, the demand for greater accountability in post-secondary schools, in the areas of the quality of student learning, student satisfaction, and persistence rates, is the driving force behind this increase (Banta, 2002). Neither practitioners nor researchers continue to view assessment as a “reporting requirement . . . (but as) an active mechanism for instructional improvement” to educate future generations (Kean, 1987, p.10). In sum, on one hand, the data from student surveys are increasingly being used as an empirical policy decision-making tool for educating future generations, while on the other hand, response rates to such surveys are on the decline.

This situation leads to conclusions from student surveys being drawn based only on a subsample of the student population of interest. Furthermore, these conclusions are the basis for an increasing number of educational decisions, both at the classroom level for curriculum and assessment purposes, as well as at the institutional level for policy and program development purposes. It appears that nonresponse bias may be affecting important decisions throughout the post-secondary education field. Specifically, decisions based on survey conclusions may be based solely on a minority subsample (the respondents) and therefore, may not generalize to the original sample (respondents and non-respondents together) and, if this is in fact the case, by extension will not generalize to the student population of interest (Viswesvaran et al. 1993).

Given this context, assessment survey research needs to include and, at times, prioritize the study of nonresponse bias if findings are to have external validity, i.e. generalizability of results to the population under examination. This study targets such a priority.

The survey tested for nonresponse bias in this study was the National Survey of Student Engagement (NSSE) (Indiana University Bloomington, 2003). This annual survey, developed with support from The Pew Charitable Trusts and the Carnegie Foundation for the Advancement of Teaching, is a result of years of work by many higher education professionals answering the call for accountability at institutions of undergraduate education across the nation. The NSSE survey instrument, called *The College Student Report* (National Survey on Student Engagement, 2003c), (see Appendix A), is administered to first-year and senior students, and directly provides data on “how their college is engaging them and also questions how much they have learned (self-report items)” (Bennett, 2001, p. 44). Indirectly, the results provide insight, as proxy indicators, on how effectively colleges are contributing to learning in five areas: (a) Level of Academic Challenge, (b) Active and Collaborative Learning, (c) Student-Faculty Interaction, (d) Enriching Educational Experience, and (e) Supportive Campus Environment. NSSE refers to the combination of these measurements as “student engagement” (Hayek & Kuh, 2002).

Unfortunately, the NSSE, which had been administered each year since 2000 at collectively more than 731 four-year undergraduate colleges and universities, had only an average institutional response rate of 43 percent for either paper or web-based modes, from a low of 14% to a high of 70% (National Survey of Student Engagement, 2003b). Given the track record of acceptable response rates for governmental and non-governmental surveys (75 to 90 percent range) previously discussed, this is rather low.

Concerned with possible nonresponse bias, such as in the case of NSSE, Pascarella (2001) emphasized how critical a high response rate is when making valid

inferences from assessment. He states directly that “one would question the appropriateness of response rates in this range (40 – 50 percent) to make credible comparisons among institutions” (Pascarella, 2001, Institutional Excellence as Effective Educational Practices or Processes section, para. 4).

Therefore, given the current empirical role of the NSSE’s *The College Student Report (The Report)* as a measurement tool in the movement to assess and improve higher education, this study was developed to empirically measure and analyze the NSSE 2004 low response rate, and possible nonresponse bias. Before its “student engagement” measurement results continue to be used as proxy indicators of learning performance outcomes, as well as institutional effectiveness, studies need to be conducted to determine the existence of nonresponse bias. If nonresponse bias is found to exist through reliable research, the NSSE 2004 data would not be representative, and a threat would exist to the external validity of the survey’s conclusions.

As a research starting point, the NSSE staff (personal conversation, September 17, 2004) did report an unpublished telephone follow-up study at 21 NSSE participating colleges and universities nationwide, with 553 non-respondent interviews of the NSSE 2001 survey, where differences between respondents and non-respondents were examined in terms of their levels of engagement. “Multivariate analysis of variance was used to compare the two groups of respondents and non-respondents...on twenty-one engagement and three demographic items for *The College Student Report*” (Kuh, 2001b, p. 13). However, the researcher was told in a telephone conversation with John Hayek, senior associate director, Center for Postsecondary Research & NSSE (personal conversation, June, 2003) that no official published report was available on this particular

NSSE follow-up study. Hayek explained that a low number of non-respondents were called and only a limited number of NSSE questions were included in the follow-up questions. Nevertheless, in both the conversation and later published articles on the NSSE, references were made by the NSSE staff that the non-respondents showed few measurable differences from the respondents. It appeared to them that the non-respondents were a bit more engaged than the respondents (J. Hayek, personal conversation, June, 2003; Kuh, 2001b, p. 13).

Given this 2001 one-time administered follow-up study, on a survey whose data are being collected yearly ever since, a gap exists in the research literature on nonresponse bias in the NSSE. As such, additional research is needed on NSSE non-respondents, with empirical data that analyze nonresponse bias, conducted in a style that can also be replicated.

This follow-up study of non-respondents to the NSSE 2004, comparing their results of the survey and socio-demographic characteristics to the initial respondents, met that need. The 2001 follow-up study, by the NSSE administrators, included all schools that administered the NSSE that year. Local studies which analyze data from individual institutions, such as this one, are also needed. Of primary interest is whether an individual institution's non-respondent subsample significantly differs from its respondent subsample. The NSSE staff who administered the 2001 national NSSE nonresponse bias study claims it does not (Kuh, 2001b).

To meet the need for local nonresponse bias studies, this study focused on one independent comprehensive Catholic university in northeastern Pennsylvania. The NSSE 2004 results and socio-demographics of the first-year respondents were compared to the

results and socio-demographics of the 2004 first-year non-respondents who filled-out and returned this study's survey.

### *Definition of Terms*

This study measured nonresponse bias of a national undergraduate assessment instrument that measures student engagement based on process and performance indicators of learning and development through the student self-report process. The following definitions are offered for clarity purposes:

Nonresponse Bias - A bias that exists in the results when respondents to a survey are different from those who did not respond in terms of demographic or attitudinal variables, or other variables relevant to the survey purpose (West, 1991).

Student Engagement – The time and energy students devote to educationally sound activities inside and outside of the classroom, and the policies and practices that institutions use to induce students to take part in these activities (Kuh, 2003).

National Survey of Student Engagement – The National Survey of Student Engagement (NSSE) documents dimensions of quality in undergraduate education and provides information and assistance to colleges, universities, and other organizations to improve student learning. Its primary activity is annually surveying college students to assess the extent to which they engage in educational practices associated with high levels of learning and personal development (National Survey of Student Engagement, 2003a).

Assessment – “An ongoing process aimed at understanding student learning. It involves making our expectations explicit and public; setting appropriate criteria and high standards for learning quality; systematically gathering, analyzing, and interpreting

evidence to determine how well performance matches those expectations and standards; and using the resulting information to document, explain, and improve performance” (Angelo, 1995, p. 7).

Process and Performance Indicators – The focus on improving “process” and “performance” in order to improve “outcomes” originated in the business world of “Total Quality Management” or “Continuous Quality Improvement” led by W. Edwards Deming (Borden & Bottrill, 1994). In the field of higher education, they are measures of behaviors associated with desired outcomes of college that estimate the extent to which students are engaged in these activities (Kuh, Pace & Vesper, 1997).

#### *Theoretical Framework*

The purpose of this study was to measure nonresponse bias of first-year undergraduate students in the NSSE 2004 at an independent comprehensive Catholic university in northeastern Pennsylvania. To examine this research topic, the study is seen through the lens of the tradition of social foundations inquiry (Cameron, 2003). This framework is applied to the fields of undergraduate learning and assessment by explaining the philosophical purposes of education. Educators who use the social foundations lens acknowledge that there are three contradictory aims of education and its assessment: “capitalist development, democratic engagement, and individual development” (Cameron, 2004, p. 3).

Therefore, from a social foundations inquiry perspective, education is not neutral (Cameron, 2004) and goals and activities of both learning and assessment need to aim directly at student engagement and development. Engagement, then, is both process and product (Shulman, 2002). In other words, learning is a continuing process of “ongoing

individual and collective learning, because the experiences of engaging, understanding and acting must become the basis of subsequent learning and development” (Shulman, 2002, The Roots of His Work section, para. 5). Viewed through this lens, this research followed the lead of assessment specialists Banta and Associates (2002), and contributed to the current evolving scholarship of assessment.

### *Significance of the Study*

Based upon the theoretical framework of social foundations inquiry with engagement hypothesized as driving the educational process, where all education is continuing education, and where the NSSE is a nationally utilized tool for its measurement, the researcher conducted research on non-respondents of the NSSE. This assessment tool was developed by many higher education professionals to measure both cognitive and affective student development and learning in a holistic fashion (Kuh, 2001b). Since its introduction, it has grown in popularity and use nation-wide. The NSSE has been used at the participating university since 2000, with response rates similar to NSSE’s national rate of 43% (National Survey of Student Engagement, 2003a). As reported by the participating university, their response rate for the NSSE 2004 was 47%; NSSE 2003 was 45%; NSSE 2002 was 29%. Despite the fact that their NSSE response rate is improving, nonresponse bias remains a concern. By studying non-respondents, this study focused on the extent to which the non-respondents of the NSSE 2004 engage in effective educational practices. Specifically, this study compared the survey results of the NSSE 2004 respondents and survey results of the NSSE 2004 non-respondents to measure nonresponse bias. Finally, the data lent further insight into the possible

existence of nonresponse bias for the NSSE according to certain socio-demographic variables.

### *Research Question and Hypotheses*

The main question that guided this study is:

What is the evidence that nonresponse bias exists for first-year undergraduate students in the results of the NSSE 2004 data collection, at an independent comprehensive Catholic university in northeastern Pennsylvania?

The two research hypotheses are:

Research Hypothesis One: There will be significant differences found between the NSSE 2004 first-year non-respondents and the first-year respondents in socio-demographic variables, such as gender, race, first-year place of residence, first-year grade point average (QPA), major of study, and parents' educational level.

Research Hypothesis Two: There will be a significant difference found between the NSSE 2004 first-year non-respondents and the first-year respondents in mean engagement scores on each of the five NSSE National Benchmarks of Effective Education Practice.

### *Assumptions, Limitations and Delimitations*

#### *Assumptions*

There are several assumptions made by the researcher for this study.

1. The methods used to approach the student non-respondent participants in this study encouraged them to complete the NSSE survey the second time they are afforded the opportunity.

2. Previous empirical and qualitative research conducted on the survey utilized in this study meets the criteria for reliability, validity and professional quality.
3. The student responses were honest since the participants will sign a consent form acknowledging that they understand that their participation will be voluntary and confidential.
4. The survey responses of the student participants met the criteria for self-reported data.
5. The SPSS software correctly performed the statistical tests utilized in this study.
6. The underlying assumptions typically associated with the statistical tests that were applied to the data collected for this study were not violated.

#### *Limitations*

One major limitation of this nonresponse bias study was the lack of random selection of participants. In addition, the timeline of the survey administration to the non-respondents might have limited the reliability of the student responses. First, it took place numerous months after the respondents took the spring 2004 NSSE assessment. Self-reported scores of non-respondents for the proposed study might have been affected by the passing of time and by a variety of experiences since the spring 2004 survey administration. Related to this survey administration delay is the concern that this study did not include a sub-analysis of early and later-responders within the responder group. Studies (Hawkins, 1975; Hochstim & Athanasopoulos, 1970; Kanuk & Berenson, 1975; Moore & Tarnai, 2002) have shown that there is a difference among these groups and such a comparison would lend more insight into nonresponse bias in the NSSE.

Possible inaccuracy of self-report data in general represents another potential limitation. This topic is covered extensively in Chapter Two where the majority of the literature confirms the validity of self-reported post-secondary student assessments (Baird, 1976; Trusheim, 1994), especially in reporting low-inference, factual data. However, Pascarella (2001) raises great concern about students' self-reporting on "less factual, higher-inference items, like the quality of teaching received, the nature of the institution's intellectual/academic environment, or self-reported growth in college" (Institutional Excellence as Effective Educational Practices or Process section, para. 5).

However, perhaps the greatest limitation of this research is generalizability. The study focused only on the NSSE non-respondents attending one undergraduate institution. Generalizing the findings of this research to all non-respondents of the NSSE, or simply to NSSE non-respondents from independent comprehensive Catholic universities, is difficult.

### *Delimitations*

The following delimitations assisted in defining the proposed study:

1. The study population included only students who are non-respondents to the NSSE 2004.
2. The study was confined to only one participating NSSE university. An independent comprehensive Catholic university in northeastern Pennsylvania served as the study setting.
3. The study was confined to one year of the NSSE administration.
4. The measurement of student engagement was defined by the student self-report process.

5. Student participants were able to read and write English.

*Summary*

A current tool for measuring short-term performance and process indicators of longer term learning outcomes is the National Survey of Student Engagement (NSSE). Unfortunately, the NSSE average response rate, since its first administration, has only achieved a percentage in the low 40s. In contrast, governmental and non-governmental surveys (not including those from the field of education) achieve response rates in the 75-90 percent range and their administrators view low response rates as creating nonresponse bias, with corresponding nongeneralizability and invalid data. To date, there has been no published empirical follow-up research with NSSE non-respondents. Therefore, this research was planned to contribute, in general, to the empirical literature on response rates and nonresponse bias. More specifically, it makes a contribution to the literature on the NSSE data measuring student engagement, with particular insight into NSSE non-respondents at an independent comprehensive Catholic university. In sum, this study's contribution, both in its general applicability and its specific focus, is one more building-block for building a scholarship of student assessment (Banta & Associates, 2002).

## CHAPTER TWO

### Literature Review

“The most important factor in student learning and personal development during college is student engagement, or the quality of effort students themselves devote to educationally purposeful activities that contribute directly to desired outcomes” (Hu & Kuh, 2002, p. 555).

“Low response rate, more than any other issue, has given mail surveys a poor image among social researchers” (Dillman, 1991, p. 229).

#### *Introduction*

The tradition of Social Foundations Inquiry is the primary theoretical framework chosen to understand the proposed study within the philosophical purposes of education. In order to specifically address the research questions proposed in this study, it is important to review the literature from several related fields of study: survey methods, undergraduate learning and institutional assessment. Initially, both the concern for nonresponse bias and its effect on survey results need to be understood and included as an integral part of survey research. The survey tool of the study is an outcomes-based assessment tool, the National Survey of Student Engagement. In order to analyze its empirical results, it is essential to understand the concepts and practice concerning this survey that measures student engagement based on process and performance indicators of learning and development through the student self-report process. In practice, the NSSE has nationally had average response rates in the low 40 percent range, which could indicate the presence of nonresponse bias in the results and nongeneralizability to its student population. Therefore, given the growing decision-making role that the results of the NSSE play at colleges and universities nationwide, additional nonresponse bias tests need to be conducted to assure external validity of the survey results. Despite the fact that

there are several nonresponse bias detection strategies identified in survey methodology literature, the one chosen for this study is a follow-up respondent/non-respondent comparison measurement study after the original survey. In sum, the research on all these inter-related fields of study are examined through the following main sections of this literature review: Social Foundations Inquiry, Nonresponse Bias, Educational Reform, and Student Involvement and Engagement.

### *Social Foundations Inquiry*

Prior to undertaking any research, the topic of interest needs to be understood within its historical and philosophical contexts. A presentation at the 2003 Assessment Institute by Jeanne Cameron (2003), and a 2004 paper on the same theme, introduced a theoretical framework that explores education in both of those contexts. Cameron began by first identifying the three contradictory aims of education and its assessment: “capitalist development, democratic engagement, and individual development” (Cameron, 2003, p. 3). She pointed out that, while these three deep-rooted and competing aims have been fueling changes in methods, processes and goals over the history of our country, most assessment debates and energy have focused on the “what” and “how-to” instead of the “why” questions. In other words, little attention has been given to the philosophical and political purposes of assessment.

In order to answer the “why” of assessment, Cameron advocates for the application of the Council of Social Foundations of Education’s (1996) tradition of social foundations inquiry that views education through the lens of

“...the humanities, particularly history and philosophy, and the social sciences, such as sociology and political science. The purpose of foundations study is to

bring these disciplinary resources to bear in developing interpretive, normative, and critical perspectives on education, both inside and outside of schools”

(Council of Social Foundations of Education, 1996, Standard I section, para. 1).

Through this lens, “assessment, like all social practices, is anything but neutral”

(Cameron, 2004, p. 15). After exploring the above mentioned three contradictory aims of education in the history of the United States, she calls upon educators to engage in learning and apply assessment “that produces the skills of critical inquiry within our students...(and) engages them as historical actors with the world” (Cameron, 2004, p.15).

In relation to this study, despite applauding the work of Banta, Ewell and other AAHE assessment experts for their work in the field, Cameron (2004) points out weaknesses in the purposes and philosophy of today’s assessment movement. The capitalist aims are explicit in their language on assessment accountability, while the democratic engagement and individual development ones are “largely implicit” (Cameron, 2004, p. 9). For example, in Cameron’s point of view, most assessment experts work from abstract goals and objectives, such as “learning that matters” and “meaningful assessments” (J. Cameron, personal conversation, June 9, 2004), without defining those terms in today’s socio-political context. From the social foundations inquiry framework, purpose and philosophy of education and assessment need to be intrinsically linked to individual development and democratic engagement, so that students can be purposeful “historical actors in the world” (Cameron, 2004, p. 15).

An examination of the purpose of the NSSE survey instrument (the survey instrument of this proposed study) shows a concern for individual development and democratic engagement. According to Cameron (personal conversation, June 9, 2004),

despite the general constraints of deductive reasoning shared by all survey instruments (i.e., that human subjects are asked to respond to the researcher's schema, rather than to generate their own), inferences can be made about democratic engagement and individual development. She points out that a number of NSSE questions deal with collaboration and community among students, and between students and faculty, and that in general the survey "explores the abilities to analyze, synthesize, reflect on, revise, integrate and apply knowledge" (personal conversation, June 9, 2004), all of which fundamentally support democratic engagement and individual development.

### *Engagement Theory and Practice*

One theoretical tool, that supports Cameron's perspective on engagement within the framework of social foundations inquiry, is Shulman's Table of Learning (Shulman, 2002). This new taxonomy links learning, assessment, and engagement, as well as theory and practice in the tradition of social foundations inquiry. While building upon and echoing Bloom, Perry, Kohlberg and Wiggins (as cited in Shulman, 2002), Shulman's Table proposes a new category in the field of education: pedagogical content knowledge (Shulman, 2002, A Table of Learning section, para. 4). For Shulman, learning begins with "pedagogies of engagement" (Edgerton, 1997) and ends with new engagements. In other words, learning is a continuing process of "ongoing individual and collective learning, because the experiences of engaging, understanding and acting must become the basis of subsequent learning and development" (Shulman, 2002, The Roots of His Work section, para. 5). This circular process follows and repeats these steps:

1. engagement and motivation
2. knowledge and understanding

3. performance and action
4. reflection and critique
5. judgment and design
6. commitment and identity (Shulman, 2002, A New Table of Learning section, para. 2).

While explaining his Table of Learning, with engagement driving this process, Shulman (2002) clearly provides the link from theory to practice when he identifies the National Survey of Student Engagement (Indiana University Bloomington, 2003) (the measurement tool of this proposed research) as the national instrument to measure student engagement. Since its first administration in 2000, each year the number of participating colleges and universities has grown from 276 (Schroeder, 2003) to 473 in spring 2004 (NSSE staff, personal conversation, September 15, 2004). Practically, having a tool that measures engagement is vital, because engagement “serves as a proxy for learning, understanding, and post-graduation commitments that we cannot measure very well directly...” (Shulman, 2002, A Table of Learning section, para. 3). Nevertheless, in addition to linking engagement theory with current practice, Shulman’s major contribution to the role of engagement in learning is that he argues that engagement “is not just a proxy for learning but a fundamental purpose of education” (Shulman, 2002, A Table of Learning section, para. 3), viewing “all education as continuing education” (Shulman, 2002, Shuffling The Deck section, para. 13). In sum, engagement is both the process and product of humans’ life-long education that develops individuals who are purposeful “historical actors in the world” (Cameron, 2004, p.15).

*Nonresponse Bias*

For purposes of this research, nonresponse bias is defined as a bias that exists in survey results when respondents to a survey are different from those who did not respond in terms of demographic or attitudinal variables, or other variables relevant to the survey topic (DDS Research, Inc., 2004). According to Ellis, Endo and Armer (1970) it is “a function of: (a) the proportion of non-respondents in the total sample and (b) the extent to which there is a systematic discrepancy between respondents and non-respondents on variables relevant to the inquiry” (p. 103). The presence of nonresponse bias is a threat to the external validity or generalizability of research findings to the target population of a study (Linder, Murphy, & Briers, 2001). A well-designed survey and a research-based administration method, following generally acceptable protocols and procedures as well as reporting them in the research analysis, are the first-steps in the attempt to increase response rates and also control for nonresponse bias (Dillman, 2000; Linder, Murphy & Briers, 2001; Porter, 2004b). Beginning at this initial step in survey methodology, this section of the literature review will cover the topics of survey response and nonresponse with insight into non-respondents, student self-reported data, and nonresponse bias as one of several survey errors that decrease the value of survey findings.

*Response & Nonresponse to Mail Surveys*

Mail survey methodology has been a popular research topic. In his comprehensive research on improving surveys, Dillman (1978) referenced 250 works up to the mid-1970s and more recently cited a 1990 bibliography by Dillman & Sangster with more than 400 works between 1970 and 1990 (as cited in Dillman, 1991). A review of this literature, as well as that from the past 14 years, demonstrates that survey response

research has generally focused on three main areas: (a) understanding non-respondents and their characteristics, (b) attributes of the survey and its administration process, and (c) developing comprehensive theoretical frameworks and models.

*Understanding non-respondents.* Throughout the literature, there have been various opinions as to why someone is a non-respondent. Sosdian and Sharp (1980) assisted with identifying four major classes of nonresponse: (a) inaccessibility – participant did not receive the survey, (b) inability to respond, due to illness, or other causes, (c) carelessness – participant lost or misplaced survey, and (d) noncompliance – participant decided not to respond to the survey. As useful as this taxonomy can be to understand reasons for nonresponse and, ultimately, assist in increasing survey response, other researchers insist on the need to assess non-respondents solely within each study's particular data set (Rogelberg & Luong, 1998).

In line with this approach, much of the empirical survey response research from the 1960s to the 1980s is heavily socio-demographic in its orientation to an understanding of non-respondents. In general, the results of the comparisons of the respondents and non-respondents in these studies are conflicting, each based on the socio-demographic makeup of the study's unique data sample.

Numerous characteristics have been examined, including socio-demographic (Hochstim & Athanasopoulos, 1970; Vincent 1964), attitudinal (Hochstim & Athanasopoulos, 1970; Porter & Whitcomb, 2004b; Rogelberg, Fisher, & Maynard, 1997), and personality type characteristics (Bebbington, 1970; Johnson & Mowrer, 2000; Vincent, 1964). However, whether or not respondents differed from non-respondents, on one demographic variable or another, “does not assure the absence of bias on other

factors...most relevant to the inquiry” (Ellis et al., 1970, p. 103). Therefore, a more thorough analysis comparing respondents to non-respondents, with emphasis on the phenomenon being studied, appears necessary. Nevertheless, according to reviews of literature in survey research (Donald 1960; Ellis, Endo & Armer, 1970; Filion, 1975; Mayer & Pratt, 1966; Nielsen, Moos, & Lee, 1978; Reuss, 1943; Rogelberg & Luong, 1998; Suchman, 1962), where studies compare demographic characteristics of survey respondents and non-respondents, participants with higher education levels and greater interest in, involvement in or loyalty to the topic, will more likely participate in the survey.

Topic involvement has been shown to positively affect response to surveys (Groves, Singer & Corning, 2000; Kojetin, Borgida, & Snyder 1993). For example, when measuring the function of incentives, respondents with high levels of community involvement displayed diminished positive effects of incentives for survey participation, while those with low community involvement displayed higher effects (Groves et al., 2000). However, Van Kenhove, Wijnen and De Wulf (2002) found that differences were true only for high involvement topics.

Bradburn (1992) reports that nonresponse is “higher among those at both ends of the income distribution, among the elderly, for men, and for those with limited English proficiency” (p. 395). Other studies (Curtin, Presser, & Singer, 2000; Goyder, 1986; Goyder et al., 2002; Kandel, Raveis & Logan, 1983; Singer, Groves, & Corning, 1999; Singer, van Hoewyk, & Maher, 2000) also found that individuals with higher income and more formal education are more likely to participate in surveys. Supporting Bradburn’s (1992) finding on gender and response, several studies found that women respond to

surveys more often than men (Curtin et al., 2000; Singer et al., 1999; Singer et al., 2000) and concerning age, older survey participants are less likely to participate (Goyder, 1986; Kaldenberg, Koenig, & Becker, 1994; Kandel, Raveis & Logan, 1983). Several studies reported that people of color respond less to surveys than whites (Curtin et al., 2000; Singer et al., 1999; Singer et al., 2000).

Demographic reports of specifically college student survey populations show similar results. Females usually respond more than males (Dey 1997; Hutchinson, Tollefson & Wigington, 1987; National Center for Education Statistics, 2002; National Survey of Student Engagement, 2003b; Porter & Whitcomb, 2004b; Sax, Gilmartin, & Bryant, 2003; Thistlethwaite & Wheeler, 1965) and white students more than students of color (Dey, 1997; National Center for Education Statistics, 2002). In addition, students with higher grades and higher levels of self-reported academic ability and engagement in college are more likely to be respondents and early respondents when time response waves are measured (Astin, 1970b; Dey 1997; Hutchinson et al., 1987; Kuh, 2001b; Nielsen et al., 1978; Porter & Whitcomb, 2004b).

Given the variations in the results of many of these socio-demographic studies, it is recommended that nonresponse and its bias be examined and tested in each separate survey situation, each with its corresponding unique participant characteristics, attitudes, behaviors and opinions on the survey topic.

*The survey and its administration.* The second general area of research literature on survey response focuses on the survey instrument itself and the administration methodology (Dillman, 2000; Linder, Murphy & Briers, 2001; Porter, 2004b; Swing & Upcraft, 2005; Upcraft, 2005). One successful example of such a study is by Hochstim

and Athanasopoulos (1970). They focused their study on the strategy of personal follow-up in mail surveys to increase the response rate. They conducted several personal-contact waves, the final one being retrieval in person. Since personal follow-up procedures are more costly than telephone interview and mail questionnaires, they conducted a cost analysis. The result was one-fifth of the surveys were collected with only a “minimum additional cost of one third of the total amount spent on data collection” (Hochstim & Athanasopoulos, p.79) and they concluded that this strategy is worth the extra cost and, hence, recommend it as a primary approach to increase response.

More recent researchers (e.g., Bradburn, 1992) question the value of the added cost as response rates have been declining. “The problem of declining response rates is better described as a problem of increasing costs to get the same response rate” (p. 396).

Despite increase in cost, with the decreasing trend in response rates (Smith, 1995; Steeh, 1991), meta-analyses have reviewed specific survey techniques and have published their findings as proven strategies to increase response (Fox, Crask, & Kim, 1988; Yammarino, Skinner & Childers, 1991; Yu & Cooper, 1983).

*Comprehensive frameworks.* In contrast to the above sampling of the survey response literature, that is either focused on participant characteristics or survey method strategies, several researchers have developed comprehensive frameworks or systems to explain and improve mail survey response. Perhaps the most renowned, the Total Design Method (TDM) was developed in 1978 by Don Dillman as a comprehensive system of procedures and techniques that “rests on both a theory of response behavior and an administrative plan to direct its implementation” (Dillman, 1978, p. 2). In sum, TDM is

an integrated approach to the entire survey process, with the goal of maximizing response.

Dillman uses the social exchange theory as developed by such authors as Blau, Homans, and Thibaut and Kelley (as referenced by Dillman, 1978) as his theoretical framework; “questionnaire recipients are most likely to respond if they expect that the perceived benefits of doing so will outweigh the perceived costs of responding” (Dillman, p. 233). From this perspective, three design factors are present at every stage in the survey design and administration process: (a) reduction of perceived costs, (b) increasing perceived rewards, and (c) increasing trust.

Several specific features of TDM have been shown to make a significant difference (Cote, Grinnell & Tompkins, 1986), including following-up with participants (in general), and especially follow-ups that inform people their questionnaire has not yet been received, versus those that provide a deadline date, and personalization (Dillman, 1991). These and numerous other procedures linked together, including a consistent positive image of the respondent, have produced studies with reported response rates that are no lower than 50 percent, while rates near 90 percent have also been obtained (Dillman, 1978).

Other researchers have designed survey response conceptual frameworks, not from a comprehensive approach, but from studying one aspect of the survey process. Childers and Skinner (1985), after reviewing the conflicting results of the effects of participant identification, or anonymity, on numerous response rate studies agreed that researchers were not utilizing a unifying conceptual framework for the study of mail survey response behavior. In response, Childers “integrated the concepts of cooperation,

trust and commitment into an exchange/equity framework for the purpose of conceptualizing survey response behavior” (p. 41).

Based upon this model, Childers and Skinner (1985) conducted a study manipulating three factors in the survey process: identification method, cover letter message, and method of address. No significant differences were found between groups concerning identification of the respondent. They recommend that in order to create coherency on survey response behavior, other survey factors, such as rewards and costs need to be studied through the social exchange/equity framework. “If the rewards outweigh the costs and the survey recipient trusts that promises will be fulfilled, commitment and cooperation should follow” (p. 42).

More recently, Groves and Couper (1998) also have devoted their work to comprehensive understanding of survey response through the framework of fundamental human behavior. After studying several U. S. household surveys in the late 1980s, they designed a conceptual structure for survey participation which views survey participation as “a function of a very dynamic social communicative process” (p. 46). The framework is heavily cognitive, and includes psychological, sociological and environmental factors that affect the relationship (the interaction) between the survey participants and the survey interviewers. They state that “if and when one controls for differences in the psychological influences on survey participation, (the socio-demographic) differences should disappear” (Groves & Couper, 1998, p. 43).

Groves and Couper base their framework on social and cognitive psychological research conducted by Eagly and Chaiken, and Petty and Cacioppo (as cited in Groves & Couper, 1998) focused on two types of decision-making: a quick superficial decision

based on the immediate options presented and a more serious thoughtful one based on the existing costs and benefits.

### *Self-Reported Data*

All student survey questionnaires rely on self-reports, where the participants reflect on their own experience with or attitude on the topic. As mentioned in Chapter One, the majority of the literature confirms the validity of self-reported post-secondary student assessments (Astin, 1993; Baird, 1976; Berdie, 1971; Trusheim, 1994), especially in reporting low-inference, factual data. However, Pascarella (2001) raises great concern about students' self-reporting on "less factual, higher-inference items, like the quality of teaching received, the nature of the institutions' intellectual/academic environment, or self-reported growth in college...." (Institutional Excellence as Effective Educational Practices or Process section, para. 5). Pike (1995, 1996) reports Pascarella's concern for using student self-reports as proxies for traditional achievement measures. "Self-report measures deal with 'gains,' whereas achievement test scores represent a more static picture" (Osterlind, Robinson, & Nickens, 1997).

In the field of higher education, examinations of the validity of self-reports (Baird, 1976; Lowman & Williams, 1987; Pace 1985; Pike 1989, 1995; Pohlman & Beggs, 1974; Turner & Martin, 1984) indicate that they are generally valid under five conditions:

1. if the information requested is known to the respondents,
2. the questions are phrased clearly and unambiguously (Laing, Sawyer, & Noble, 1988),
3. the questions refer to recent activities (Converse & Presser, 1989),

4. the respondents think the questions merit a serious and thoughtful response (Pace, 1985), 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 (Bradburn & Sudman, 1988) (as cited in Hu & Kuh, 2002).

In past years, Pace (1985) and Pike (1995) found that student self-reports positively correlated with relevant achievement test scores. These studies were done with the College Student Experiences Questionnaire (CSEQ), whose “scores are generally consistent with evidence of actual (achievement test) gains” (Hu & Kuh, 2002, p. 557). More recent studies with the CSEQ (Anaya, 1999; Pike, 1996, 1999) concluded that student self-reported gains could be considered as proxies or “general “indicators” for outcome measures of the students’ college experience. “However, there is not a one-to-one correspondence between self-reports and more objective measures of achievement” (Pike, 1996, p. 110), such as test scores. In addition, this research produced “ambiguous results concerning the stability of relationships across different types of institutions” (p. 89), indicating caution in comparing student self-reports from more than one institution.

Pike is not alone in calling for caution with self-reports. The findings of the 1997 study by Osterlind, Robinson and Nickens also indicated that student self-reports cannot “appropriately serve as proxies for traditional measures of scholastic attainments” (p. 256). Likewise, the findings in 1999 by Anaya agreed that student self-reports cannot replace measurement by standardized tests.

The effect of Thorndike’s (1920) “halo error” on students’ self-reports of gains in educational outcomes research is another issue of concern with self-reports (Pike, 1993,

1999). This effect occurs when ratings are made by relying on general perceptions, even when they were to be made on specific items. From several studies, Pike (1999) found the halo error more pronounced for first-year students than for senior students due to the fact that older students have more experience and training in self-evaluation than first-year students. Pike concluded that this inflation of students' self-reported gains could ultimately be "damaging to quality improvement efforts" (p. 63) at the university relying on the data from the students' assessment. However, Pike believes that assessment training for students can "partly offset errors such as halo" (p. 83) and needs to be taken into account by assessment professionals when utilizing surveys.

Such increased participation by students in the university's assessment process can only be beneficial. Both the student and the institution benefit. Angelo (1994) and Bambenek (1996) are champions of increasing the involvement of students in the training for and assessment of their own learning and the university's role in that process. As an assessment participant, students are exposed to additional learning experiences, including a greater understanding of their own college experience as well as of the responsibilities of citizenship as a member of a community. The university benefits because students become more involved, communicate their needs and are able to contribute to quality improvement. Bambenek (1996) outlines numerous opportunities and varying degrees of involvement for student assessors, including membership on the school's assessment advisory committee. However, it all begins with students deciding to be respondents (vs. non-respondents) to a student survey and to contribute their self-reported data.

*Nonresponse Bias as Survey Error*

According to survey research professionals, nonresponse bias has been identified as one of four possible types of error (sampling error, coverage error, measurement error and nonresponse error) in survey research (Dillman, 2000; Linder, Murphy & Briers, 2001). Most recently, a 2004 survey methodology text added processing error and adjustment error creating a “total survey error paradigm” (Groves, Fowler, Couper, Lepkowski, Singer & Tourangeau, 2004). Nevertheless, when any of these survey errors increase, the results and conclusions of the study decrease in value. Unfortunately, less time and attention have been devoted to reducing nonresponse error, whose reference is rarely mentioned in published survey findings (Hawkins, 1975; Linder, Murphy & Briers, 2001).

This situation was revealed in a study (Linder, Murphy & Briers, 2001) of 364 published articles on how nonresponse has been historically handled in agricultural education research. The authors concluded that “not mentioning nonresponse error as a threat to external validity of a study, not attempting to control for nonresponse error, or not providing a reference to the literature were unfortunately the norm and not the exception (§ 1).

*Relationship to response rates.* The review of literature, described above in the section on surveys and their administration, explains how certain survey procedures can increase response rates. However, nonresponse bias can exist even when the response rate is high. Researchers have stated (Miller & Smith, 1983; Rogelberg & Luong 1998) that nonresponse bias can be a concern for response rates as high as 90 percent. Other survey research guides, (Linder, Murphy & Briers, 2001), suggest that nonresponse bias

needs to be tested from an 85 percent response rate; Gall, Borg, and Gall (1996), and Tuckman (1999), suggest action from an 80 percent response rate and below; Ary, Jacobs and Razavich (1996) suggest action at 75 percent.

Despite the rate of response, nonresponse bias does not exist simply when there is nonresponse on the part of survey participants. Rogelberg and Luong (1998), clarify the definition of nonresponse through the following equation:

$$\text{Nonresponse bias} = \text{NR}(X_{\text{res}} - X_{\text{non}})$$

NR refers to the proportion of non-respondents in the sample.

$X_{\text{res}}$  represents the respondents' mean on some relevant variable.

$X_{\text{non}}$  is the mean for the non-respondents, if it were actually known, on the same variable (p. 61).

For the past several decades, despite the fact that many empirical researchers have not appropriately dealt with nonresponse, the concern for nonresponse bias has occupied time and resources of researchers, irrespective of the survey topic. A 1970 historical review of efforts to solve this problem, by Ellis, Endo and Armer, cites studies as far back as a 1939 nonresponse study on former university students by Robert Pace. More recent studies report general population survey nonresponse as increasing (De Leeuw & Heer, 2002; Schwarz, Groves, & Schuman, 1998; Smith, 1995; Steeh, 1981) as well as nonresponse in student surveys (Dey, 1997; Sax, Gilmartin, & Bryant, 2003).

*Detection strategies.* To detect and overcome nonresponse error, researchers have devised solutions of various types both before and after the data collection stage is complete. As mentioned above, diligently applying procedures and strategies recommended by survey experts, (Alrack & Settle, 1995; Dillman, 2000; Groves, Fowler,

Couper, Lepkowski, Singer & Tourangeau, 2004), prior to the end of data collection, is a first step. The researcher can ask additional questions about the participants' interest in the topic. Rogelberg and Luong (1998) recommend to later "test for a relationship between responses to these items and responses to the actual survey topic" (p. 63).

Once data has been collected, there have been several major methodologies employed throughout the literature. One approach, the record linkage approach, uses other records as sources for data, in addition to the original survey, to compare respondents and non-respondents (Goyder, 1986, 1987; Goyder, Warriner, & Miller, 2002; Groves & Couper, 1998; Hesselden, 1976; Lillibridge & Beck, 1995; Porter & Whitcomb, 2004b; Thistlethwaite & Wheeler, 1965) or to compare respondents to the original population (Miller & Smith, 1983). However, the information used in the past from public or administrative records or census data, according to Ellis et al. (1970), has been narrow in scope (limited to socio-demographic characteristics) and usually not of primary interest to the topic of the study. One record linkage study (Porter & Whitcomb, 2004b) specifically measured variables to understand why students participate in multiple surveys. Their review of literature was the only nonresponse bias study to mention the nonresponse experience of the NSSE (rates between 14% and 70%), the survey tool of this study.

A second longstanding approach, which applies a mathematical or statistical solution, gives compensatory weights to the respondents' data that "most closely resemble the non-respondents in their input characteristics (Astin, 1970b, p. 446). The researcher adjusts the data by quantifying the nonresponse bias and then making needed adjustments in the survey statistics (such as linear regression) in order to reduce its

effects or even correct it (Filion, 1975; Fuller, 1974; Hawkins, 1975). In general, weighting represents “the inverse of the probability of being sampled and responding, respectively” (Dey, 1997). Mandell’s (1974) formula assists with determining bias. Astin and Molm (1972) developed a weighting procedure for use in higher education surveys that “calculates the likelihood that a student will return a completed survey” . . . (and adds more) weight to the responses of those students who most resemble the non-respondents” (Dey, 1997, p. 217). Dey (1997) concluded that even with surveys with low response rates, “the Astin and Molm weighting procedure is very effective in reducing nonresponse bias” (p. 225).

In addition, Rogelberg and Luong (1998) identified the most common statistical procedures in all fields of study including “population-based weighting-class adjustments, sample-based weighting-class adjustments, propensity-model weighting, full-case imputation, and selection-model adjustments” (p. 64). Whichever procedure is used, some researchers (Bradburn, 1992) theoretically view weighting as flawed because “it assumes that there is no correlation between willingness to respond and the substantive answer to the survey questions” (p.395).

The review of literature showed that a third approach has been the most utilized approach. It conducts research through a wave analysis, comparing early and late respondents, “using later respondents as proxies for nonrespondents,” (Moore & Tanai, 2002, p. 211). Each wave can be defined by “days to respond” or by a separate response stimulus, such as a follow-up post-card, telephone call, or personal visit (Linder, Murphy & Briers, 2001). Having been first formerly introduced by Robert Pace (1939), this method views response and nonresponse on a continuum of resistance to survey

participation. The assumption is that late respondents, who responded only after considerable follow-up efforts, are “almost” non-respondents. This approach was popular (Armstrong & Overton, 1977; Donald, 1960; Ferber, 1948; Green, 1991; Hawkins, 1975; Linsky, 1975; Mayer & Pratt, 1966; Nielsen, Moos, & Lee, 1978; Robins, 1963; Suchman, 1962), despite “far from reassuring” (Ellis et al., 1970, p. 104) results. After testing this premise, the 1970 study by Ellis, Endo and Armer found that when they divided student participants into four respondent groups [(a) early respondents, (b) late respondents, (c) potential non-respondents, and (d) non-respondents, that neither late respondents nor potential non-respondents] “provide a suitable basis for estimating the characteristics of non-respondents (p. 108). Their findings led them to agree with Pace (1939) that such studies provide “a clue only to the direction of nonresponse bias, not its magnitude” (p. 108).

Based on these findings, Ellis et al. (1970) agreed with other earlier researchers (Baur, 1947; Deming, 1944) that slow-to-respond respondents cannot be assumed to be like non-respondents [specifically termed “terminal” non-respondents according to Hawkins (1975)], and therefore, the above mentioned approaches that are based on this premise, including the mathematical weighting technique, are not justified. Similarly, Nielson, Moos and Lee (1978) conclude from their study that researchers cannot resolve response bias through statistical adjustments based on data from the original survey analysis.

This leads to the reliance on the least common, yet most thorough, approach to study nonresponse bias: one that focuses exclusively on the actual non-respondents themselves, called “refusers” by some researchers (Bebbington, 1970), with a follow-up

comparison measurement study after the main study has been completed. This approach has been termed “double-sampling” (Groves & Couper, 1998), “double-dipped” sampling (Miller & Smith, 1983), and “over-sampling” (Hayek, 2004, personal communication, June approx 2, 2004). A coding system is applied (either on the survey itself or on a separate postcard to be sent in by the respondent) in order to identify the respondents’ surveys and ultimately know who are the non-respondents (Rogelberg & Luong, 1998).

Once the non-respondent sample can be identified, an additional source of records is used to provide a data set to compare the respondents and non-respondents on a variety of variables. However, as discussed above, a socio-demographic comparison is not sufficient for a response bias study (Bradburn, 1992; Rogelberg & Luong, 1998). Neither is the strategy of statistical adjustment (Ellis, Endo, & Armer, 1970; Nielson, Moos & Lee, 1978). Whether or not differences exist among such socio-demographic variables, a comparison is needed on issues of importance to the survey topic. In order to accomplish such a measurement, additional follow-up is required by surveying the non-respondents. The survey can be administered by mail or by telephone, with part or all of the actual survey in question. Comparisons can then be conducted on items and variables relevant to the research topic, in addition to socio-demographic variables (Ellis et al., 1970; Rogelberg & Luong, 1998). In the studies reviewed, researchers agree that most or all of the survey items need to be included.

Researchers differ on the number of non-respondents they suggest should be included in the survey sample. Gall et al. (1996) and Lindner, Murphy and Briers (2001) suggest no less than 20 non-respondent cases, because “using fewer than 20 responses threatens the statistical power to detect differences between respondents and non-

respondents” (P. 41). Alternatively, Tuckman (1999) recommends using five to ten percent of the non-respondents, and other researchers (Rogelberg & Luong, 1998) simply say a random sample.

According to current higher education survey methods professionals, there is no official guideline for a minimum or an acceptable response rate for a nonresponse bias follow-up study (John Tarnai, personal email September 8, 2004; Mick Couper, personal email September 17, 2004). However, others advise to approximate the response rate of the original survey (John Tarnai, personal email communication September 8, 2004; Barbara Sadowski, personal email communication September 17, 2004). Nevertheless...“it's not so much about response rates, but how different the respondents are from the non-respondents...(and) you want to be able to claim that the respondents you get (to the nonresponse follow-up survey) represent all non-respondents” (Couper, 2004). More specifically, according to Tarnai, “the real issue is not response rate, but how any non-respondents compare to the respondents on *survey items* [italics added].”

The review of the literature found few studies that actually gathered follow-up data directly from non-respondents (Boser, 1988; Brightman, 1972; Carifio, 1987; Donald, 1960; Green, 1991; Hagberg, 1968; Kuh, 2001b; Michigan State Department of Education, 1981). Most of these studies were in the field of education. Boser (1988) reported that non-respondents tended to be older than respondents but no significant differences were found for GPA or achievement test scores. However, Boser only compared differences between respondents and non-respondents on demographic variables, and did not compare mean scores from the non-respondents' survey data on the survey topic of employment. Therefore, the research effort was not a complete example

of a nonresponse bias study. Neither were Brightman's (1972) follow-up telephone interviews with former community college students who did not respond to a similar mail survey, because no survey means were compared. Green's (1991) follow-up study of non-respondents was a small addition to a wave analysis study. She concluded that it was worthwhile to conduct the non-respondent follow-up as there were significant differences between them and the respondents, while only minor differences existed across the waves of respondents.

From a critical perspective, Groves and Couper (1998) report that the non-respondent follow-up approach is "often hampered by low response rates" (p. 50), while Goyder (1986) states that "employing an instrument to measure (a survey's) own performance is immediately contradictory" (p. 28).

Nevertheless, education researchers are employing this nonresponse bias detection strategy. Carifio (1987), Hutchison, Tollefson and Wigington (1987), and Kuh (2001b, 2003) conducted non-respondent follow-up surveys. Hutchison, Tollefson and Wigington (1987) found an absence of bias in college freshmen's responses to three mail surveys when comparing attitudes toward academic life as well as socio-demographic variables. However, they stated clearly that these findings "were contrary to expectation, because previous research suggests that low response rates produce bias" (p. 105) and called for further research.

As explained in the Introduction section, despite the fact that the average institutional response rate remains in the low 40 percent range (National Survey of Student Engagement, 2003b), only one nonresponse bias study has been conducted on the results of the NSSE (the survey under investigation in this research proposal) since its

first administration in 2000. Kuh (2001a) and Hayek, (personal conversation, June, 2003) report that the non-respondents showed few measurable differences from the respondents, yet it appeared that the non-respondents “may actually be slightly more engaged than respondents” (Kuh, 2001b, p. 13).

Carifio (1987) conducted a follow-up nonresponse bias study on graduates who did not respond to a community college vocational education survey. The results of the original data were challenged by education officials due to a 35.4% response rate and possible response bias. Carifio concluded that the data originally obtained from the respondents were “reasonably representative of the population” (p. 19). Nevertheless, he recommended that “replication would be useful” (p. 19) in similar situations where decision-makers are not confident of the validity of data due to low response rates.

In line with Carifio’s replication recommendation, this study attempted to resolve one such similar situation, where the external validity of the data is in question due to the comparatively low response rate. The nonresponse bias detection approach for this Study was a follow-up survey of NSSE 2004 first-year non-respondents at an independent Catholic university. This choice was based on the understanding that nonresponse bias is measured by comparing, not only the socio-demographic characteristics of the survey participants (respondents and non-respondents), but also comparing survey items and variables relevant to the research topic (Bradburn, 1992; Carifio, 1987; Ellis, Endo & Armer, 1970; Gall et al., 1996; Hutchison, Tollefson & Wigington; 1987; Kuh, 2001b; Lindner, Murphy & Briers, 2001; Nielson, Moos & Lee, 1978; Pace, 1939; Rogelberg & Luong, 1998; Tuckman, 1999).

*Educational Reform*

The development of efforts to improve undergraduate education over the past several decades has been partly in response to national reports widely published beginning in the 1980s that called for a more integrated approach to and greater accountability for undergraduate education.

As a result, educators have been developing frameworks and tools to reform, as well as to empirically measure (by more student surveys), the quality of students' learning in both cognitive and affective development. National 'calls' for accountability for student and institutional performance (Association of American Colleges, 1985; 1991; Boyer, 1987; Education Commission of the States, 1995; The Middle States Commission on Higher Education, 2002; Study Group, 1984; U.S. National Commission on Excellence in Education, 1993; Wingspread Group, 1993), coupled with increased undergraduate attrition rates (Tinto, 1993; Ulmer, 1989) have created a focus on outcomes of the college experience. In addition to the need to increase data-driven decisions, Ulmer (1989) cited the greater demand from applicant families for more information to make wiser college choices. Kuh (1999), from his study "Tracking the Quality of the Undergraduate Experience, 1960s to the Present," concluded that these calls for reform seem to have been justified, while Sewall (1996) named the 1990s as the "decade of accountability" due to the extensive reexamination of educational practice.

A common theme among these studies is the growing realization that the academy must undertake a comprehensive reform of undergraduate education, with special emphasis on improving the first-year experience. Many recommended "frontloading"

higher education by “putting the strongest, most student-centered people, programs and services in the freshmen year” (Levitz & Noel, 1989, p. 79).

All of these documents asked for a greater attentiveness to the challenges facing higher education at the time. These included how to address the increased racial and ethnic diversity among students entering higher education, the increased incidence of academically under-prepared students, and the escalation of attrition in undergraduate education. These reports urged that education be more student-oriented, actively engaging students in their education, as well as teaching them to assume more responsibility for their learning (Boe & Jolicoeur, 1989; Murphy, 1989; Upcraft, Gardner & Associates, 1989).

In response to these pressures, hundreds of institutions are now engaged in outcomes assessment (Kuh & Vesper, 1997). One survey (El-Khawas, 1995) found that 82% of colleges and universities in the United States were involved in the process of outcomes assessment. Two thirds were developing their own instruments for student assessment (Mentkowski, Astin, Ewell, & Moran, 1991).

Initially, the “Seven Principles for Good Practice in Undergraduate Education” (Chickering & Gamson, 1987) served as the foundation for the development of assessment tools used to measure process indicators of such “good practice. They agreed that good practice:

1. Encourages contacts between students and faculty
2. Develops reciprocity and cooperation among students
3. Uses active learning techniques.
4. Gives prompt feedback

5. Emphasizes time on task.
6. Communicates high expectations
7. Respects diverse talents and ways of learning (Chickering & Gamson, 1987, p. 3).

Adding to this framework, Banta and Kuh (1998) emphasize that these practices are most successful when undertaken by both academic faculty members and student affairs professionals, with a combination of learning issues from academic and student life. They advocate for a “holistic view of learning” (Banta & Kuh, Conclusion section, para. 1), in order for undergraduate learning and development to be accurately assessed.

Within a few years, an extension of the call for accountability moved from undergraduate learning, in general, to accountability for assessing that learning in particular. From 1989 to 1992, the AAHE brought together a group of assessment experts for a series of meetings to identify successful practice of outcomes assessment in higher education. Initially, they identified nine principles of good practice for assessing student learning based on campus experiences of the members, plus others observed during hundreds of post-secondary school visits. The tenth principle was later drafted by the authors of *Assessment in Practice* (Banta, Lund, Black, & Oblander, 1996).

The 10 Principles of “Good Practice for Assessing Student Learning” are:

1. “The assessment of student learning begins with educational values.
2. Assessment is most effective when it reflects an understanding of learning as multidimensional, integrated, and revealed in performance over time.
3. Assessment works best when the programs it seeks to improve have clear, explicitly stated purposes.

4. Assessment requires attention to outcomes but also and equally to the experiences that lead to those outcomes.
5. Assessment works best when it is ongoing, not episodic.
6. Assessment fosters wider improvement when representatives from across the educational community are involved.
7. Assessment makes a difference when it begins with issues of use and illuminates questions that people really care about.
8. Assessment is most likely to lead to improvement when it is part of a larger set of conditions that promote change.
9. Through assessment, educators meet responsibilities to students and to the public.” (American Association for Higher Education (AAHE), 1992, p.2)
10. “Assessment is most effective when undertaken in an environment that is receptive, supportive, and enabling.” (Banta, Lund, Black & Oblander, 1996, p.62).

Recognizing that these 10 principles are all valuable practices for assessing student learning, specifically for purposes of this study, Principle Nine (listed above) is emphasized as it is directly linked to the NSSE. Through assessment by way of the NSSE, (where engagement is measured as a proxy to measuring learning) educators can meet responsibilities to students and to the public. However, as the study examined, when the response rate is low and nonresponse bias exists, the assumption that the data collected are externally valid and generalizable to the population surveyed is suspect. External validity and generalizability of results is a fundamental condition of educational assessment surveys in order for educators to meet their responsibilities to both their students and the public (American Association for Higher Education, 1992).

A year after the drafting of the assessment principles, Banta's (1997) work on "moving assessment forward" (Banta, p. 79) outlined numerous "barriers to success" (p. 88) that assessments will encounter when striving for the 10 Principles of Good Practice for Assessing Student Learning. Upon analysis, two barriers in particular are directly related to this study: (a) limitations of assessment tools and methods, and (b) insufficient involvement of students.

Both of these barriers apply to the NSSE and the issue of a low response rate and possible nonresponse bias. However, "no instrument is perfectly reliable or valid...nor should we give up on a given assessment method because it is imperfect" (Banta, 1997, p. 89). Banta describes the Catch 22 situation that exists with responder rates: "instruments must be sufficiently reliable and valid to inspire trust" (p. 90) to motivate high and credible responses and response rates, while simultaneously high and credible response rates will allow the instrument to be more reliable and valid. In sum, this study on nonresponse bias is integral in the quest of educators to conduct good practice for assessing student learning.

#### *Outcomes Assessment and Performance Indicators*

From the early years of outcomes assessment in higher education, as in the business world (Deming, 1986), reviewing only the end product or service did not meet the needs of administrators with goals of quality improvement through strategic decision making (Borden & Banta, 1994). Assessment specialists, including Palomba and Banta (1999), suggest that measuring the improvement and progress of the student over time is a more accurate focus of assessment than outcomes assessment alone at the end of the process. This is because "outcomes data represent what students have learned, but they

do not necessarily point to student behaviors and institutional practices that produce the outcomes” (Kuh, Pace & Vesper, 1997, p. 436).

As an alternative to measuring outcomes directly, educators have been developing process indicators (linked with outcomes) to measure student learning and development over time. As mentioned in Chapter One definitions, performance and process indicators originated in the business world of “Total Quality Management” or “Continuous Quality Improvement” led by W. Edwards Deming (Borden & Bottrill, 1994). This assessment movement is based on the idea that “quality comes not from inspection, but from improvements in the...process” (Deming, 1986, p. 29).

In the field of higher education, process indicators serve as indirect indicators (proxies) of progress towards desired long-term outcomes of attending college, as well as for improved undergraduate education (American Association for Higher Education, 1992; Astin, 1993; Banta & Associates, 1993; Ewell & Jones, 1991; Pascarella & Terenzini, 1991). Viewed along the higher education process continuum, process indicators are the short-term variables that moderate or intervene in the process and that can measure student behavior and/or institutional practice. “In general, they embrace what colleges and universities require of their students, what typically happens in a collegiate classroom or course of study, and what college students do as a part of their education” (Ewell & Jones, 1991, p.10). More specifically,

they include: a) institutional curricular and skills requirements for attainment of the baccalaureate, b) indicators of instructional “good practice” consistent with the development of critical thinking and communications abilities, and c) student behavior and self-reported

gains (Ewell & Jones, 1991, p. abstract).

Moving from theory to practice, assessment scholars Ewell and Jones (1996) published a work of 65 process indicators of good practice that can be measured in response to the calls for “information-based accountability and reform in undergraduate education” (p. 5). This handbook was designed to help educators “understand, design, and implement such indicators’ (p.7). These examples, together with those of the *Inventories of Good Practice in Undergraduate Education* (Chickering, Gamson, & Baris, 1989) are recommended by Kuh and Vesper (1997) to be “used in combination with outcomes data to produce an expanded network of associations between practices and desired outcomes of college” (p. 6). A companion piece focusing on faculty performance indicators with classroom assessment techniques was developed by Angelo and Cross (1993).

One specific indicator example, student-reported data on their own behavior and learning gains, has been empirically shown to serve as a proxy for national test scores (Ewell & Jones, 1991, 1996). Kuh, Pace & Vesper (1997) concluded that “correlations between self-reported activities reflecting good practices in undergraduate education....are positive and significant educationally as well as statistically” (p. 447), while also reporting the same findings at various types of institutions, as well as with students at different years of enrollment.

In terms of this study, the National Survey on Student Engagement has developed from the above summarized outcomes assessment movement and growing interest in performance indicators. Education professionals (Ewell & Jones, 1996; Pace, 1984) “had recommended the development of additional data-gathering efforts centered on

instructional practices and student experiences as an integral part of the assessment process” (Astin, 1991; as cited by Ewell & Jones, 1996, p. 6). In response, the data collected by the NSSE measures student engagement based on process and performance “proxy” indicators of learning and development through the student self-report process. In sum, the NSSE is an example of a research tool that is meeting the need of today’s higher education professionals for statistical information to answer the concerns of policy makers, education leaders, parents and students about academic outcomes and instructional practices.

### *Student Involvement and Student Engagement*

This section of the review of literature explores the following assumption that underlies the subject of the NSSE: the more involved students in undergraduate education are in their academic and social lives, the more satisfied they are with their education and the more likely they are to stay at an institution to complete their degree. Throughout the literature, the terms student involvement and engagement have at times been used interchangeably. However, the concept of student involvement (Astin, 1984) precedes that of student engagement (Kuh, Schuh, Whitt & Associates, 1991; Tinto, 1993) and each will be explained in the following sections.

#### *Student Involvement*

Alexander Astin, one of the first researchers to use the phraseology “student involvement,” developed the “Student Involvement Theory.” Astin (1984) states that “quite simply student involvement refers to the amount of physical and psychological energy that the student devotes to the academic experience” (p. 297). Involved students devote time and energy to their studies and to campus life, and spend time with their

faculty and peers. He reported that there is a positive relationship between levels of involvement, personal development, and levels of learning. The research reveals that the more time students spend with their studies, attending class and other academic related activities that require a high degree of involvement, the more they develop, the higher their level of knowledge acquisition, and the more satisfied they are with their educational experience (Astin, 1984; Pascarella & Terenzini, 1991). Student involvement embraces academic and social activities, actions, interactions, and associations, which occur among students, between faculty and students, and with the educational environment itself (Astin, 1993; Light, 2001; Pascarella & Terenzini, 1991; Tinto, 1993).

In 1993, Astin's results emerged from an analysis of data collected from a study conducted by the Cooperative Institutional Research Program (CIRP). At the time, his study was "the largest on-going study of the American higher education system, with longitudinal data covering some 500,000 students and a national sample of more than 1,300 institutions of all types" (p. 4). His research included both baccalaureate and associate degree institutions, and measured student involvement after a student had been at an institution for a period of time. Astin (1993) set forth certain categories of involvement in higher education used as variables in his research: academic involvement, involvement with faculty, involvement with student peers, and involvement in work, and he specified the ways these different forms of involvement can influence student development.

Astin (1993) identified specific aspects of the concept of student involvement and its relationship to academic outcomes. An illustration of the nature of his work and

findings is the subset “time allocation,” defined as hours spent studying and doing homework. Appropriate time allocation, Astin asserted, more than other measured types of involvement, has positive correlations to academic outcomes: retention, graduating with honors, enrollment in graduate school, and self-reported increases in cognitive and affective skills. He characterized this involvement as encompassing enrollment in classes, studying, working with peers on projects and assignments, working on research projects or independent studies (possibly with faculty), and enrollment in special courses or programs, academic in nature, for enrichment or interest. In conclusion, Astin (1993) confirmed through his research the common sense observation that students learn what they study; thus more time spent (in actual studying, class participation, library research, tutoring, and computer use) yields more learning.

In this same study, Astin (1993) reported how lack of involvement with peers, faculty, and the college environment in general leads to and defines a more isolating experience. He cataloged the extent to which variables such as “living at home, commuting, employment off campus, and watching television” (p. 424) negatively impact student involvement, generating a negative correlation with respect to both cognitive and affective outcomes. In sum, all forms of student involvement affect academics, retention, and the overall academic experience.

A number of large studies and extensive reviews of the literature examine student involvement. In support of Astin’s work (1977, 1993), Pascarella and Terenzini’s (1991) review of more than 2600 studies supports the concept that student involvement, both social and academic, results in better academic performance, has a positive influence on

dimensions of general cognitive development, and improves retention along with many other positive results.

Vincent Tinto undertook research examining student departure and provided a link between student involvement and student engagement. From this research he describes “social and academic engagement,” the absence of which he asserts is a major factor in student departure. Tinto (1993) reported that “academic and social engagement emerges from student involvement with faculty and student peers in communities of the classrooms. It is a process which, over time, links classroom engagement with faculty and student peers to subsequent involvement in larger academic and social communities of the college” (p.133).

Tinto’s (1993) research revealed that students leave institutions of higher education for two main reasons. One is a pre-entry condition, a person’s intentions and commitments (disposition). Tinto stated that students bring with them characteristics and past experiences that form their disposition. These include such traits and characteristics as aptitude, personality, family background, and views and opinions on higher education. These lead students to interact with the institution in different ways and influence how successfully a student will become engaged (Tinto, 1993).

The other reason is post-entry, the experiences the student has with the institution after arriving, including interactions with both the academic and social communities at the institution. Tinto (1993) stated:

The more students are involved academically and socially, the more likely are they to become more involved in their own learning and invest time and energy to learn. Involvement, especially academic

involvement, seems to generate heightened student effort. That effort, in turn, leads to enhanced learning. . . Other things being equal, the more students learn, the more likely are they to persist, even after controlling for student attrition (p.131).

Tinto also maintained that unresolved transition issues, and the related stress they invoke, result in student departure. Tinto (1993) reported that most students are left on their own to "learn the ropes of college life" (p. 99) and are unable to make contacts on their own. Interventions that increase personal contacts with members of the college can help students achieve both intellectual and social integration. Mechanisms such as First-Year Seminars, designed to address transition issues proactively, can help students integrate themselves into the institution. Tinto reinforces the concept that the absence of interactions results in an individual's feeling isolated from the intellectual life of the institution, and he concluded that the absence of interaction manifestly increases the likelihood of departure.

### *Student Engagement*

The term "student engagement," as it is measured by the NSSE, developed out of years of research on student involvement coupled with the development of outcomes assessment through learning process indicators for both students and faculty. In comparison, "student involvement" is a broader concept, representing an investment of time in college or university activities not necessarily solely educational.

Researchers saw the need for a new term and new tool based on Chickering and Gamson's (1987) "Principles of Good Practice" and Ewell and Jones' (1996) *Indicators of Good Practice* (Kuh & Vesper, 1997). In 1997, Kuh and his research associates

concluded that “systematic assessment of the activities in which students engage is also needed to identify where and how faculty and students might change their behavior so that students engage more frequently in good practice” (¶ 30).

Therefore, Kuh expanded Tinto’s perspective and since the late 1990s, developed the concept of student engagement, as measured by the NSSE, with reference to educational outcomes that research verifies as being empirically effective. Kuh (1999) has examined factors at the course and at the institutional level related to engagement in higher education and was a founder of the National Survey of Student Engagement (NSSE) (Indiana University Bloomington, 2003). This national tool is organized “according to five benchmarks of effective educational practice that reveal key aspects of student behavior and institutional performance bearing directly on collegiate quality” (Indiana University Bloomington, 2003). The five benchmarks (scales) are derived from the work mentioned above by Chickering and Gamson (1987). These scales are: (a) Level of Academic Challenge, (b) Active and Collaborative Learning, (c) Student-Faculty Interaction, (d) Enriching Educational Experiences, and (e) Supportive Campus Environment (see Appendix M). The NSSE self-reporting survey instrument, The College Student Report (National Survey of Student Engagement, 2003c) measures students’ perception of their own experiences. By proxy, the NSSE measures institutional performance by students’ self-reports or ratings on specific educational practices, identified by the five engagement scales and additional individual survey items.

NSSE literature reports:

Student engagement represents two critical features of collegiate quality. The first is the amount of time and effort students put into their

studies and other educationally purposeful activities. The second is how the institution deploys its resources and organizes the curriculum and other learning opportunities to get students to participate in activities that decades of research studies show are linked to student learning (Indiana University Bloomington, 2003).

The assumption is that the quality of an institution can be established by comparing the level of student engagement at an institution relative to its peers; the more engaged students are at a specific institution, the better the quality of that institution. In other words, the measurement of student engagement, to determine whether an institution is offering quality education, is an example of the phenomena of examining process indicators as “proxies” for the assessment of desired outcomes of college.

*Findings on engagement.* The 2003 NSSE report, published on its Web site, provides data for that year, derived from surveys administered to 348,000 first-year and senior students at 437 institutions of higher education (National Survey of Student Engagement, 2003b, p. 1). Key findings include the fact that schools have developed a number of programs to foster student engagement. First-Year Seminars, service learning courses, capstone experiences, and internships are examples. Although some or all of these opportunities are in place at institutions, the data reveal that:

- 55% of first-year and 66% of senior students responded often or very often that they “received prompt feedback from faculty on academic performance (written or oral);”
- 61% of first year students and 46% of seniors surveyed “never worked with faculty members on activities other than coursework;” and

- “more than half (56%) of all seniors never participated in a community-based project” (National Survey of Student Engagement, 2003b, p. 5).

Other findings from the survey include how smaller schools, as well as liberal arts schools, tend to have more engaged students. Commuter students and part-time students do not find their campus environment as supportive. African-American and Asian-American students were not as positive as other students concerning their relationship with other students and faculty members. Finally, one of the more striking findings from this study is that only 13% of students reported that they spend more than 25 hours a week studying, the amount that faculty members believe is an optimum amount of time students should spend on academic activities (National Survey of Student Engagement, 2003b).

In addition to the NSSE, other studies have examined student engagement. In 2002, Hu and Kuh (2002) published a study that examined levels of engagement among 50,883 full time undergraduates from 123 different colleges and universities between 1990 and 1997, from their responses to the College Student Experience Questionnaire (CSEQ), administered from Indiana University. This is a self-reporting instrument measuring students' perception of their experiences. The survey examined student behaviors highly correlated with educational outcomes. Based on previous research, the authors hypothesized that “students who devote a relatively high level of effort to a variety of educationally purposeful activities gain more from college than those who focus on only one activity or who put forth little effort in only a few” (Hu & Kuh, 2002, p. 16). The findings from this study revealed that certain “background characteristics” such as academic preparation, years of college experience, and the student's area of study,

interact in complex ways influencing levels of engagement. These factors, according to the study, have a cumulative effect on engagement. Validating and building on past research, these findings concluded: students are more engaged the longer they are in college and the more they are academically prepared. Institutional selectivity did not affect levels of engagement, although public institutions, and those emphasizing practical and vocational careers, report lower levels relative to engagement. Peer interaction influences the college experience, including how students spend their time and their level of satisfaction. The study suggested that the more meaningful and concrete faculty can make students' education, the more likely they will be to get them involved. Faculty and other institutional members could increase engagement by establishing high standards and expectations for students. Hu and Kuh (2002) concluded that “student engagement is a function of the interaction of student and institutional characteristics” (p. 20).

Another author who has conducted research related to student engagement is Richard Light (2001). He reported that students who have difficulty transitioning to college often cite feelings of isolation from the college community, not being involved in extra-curricular activities, not participating in study groups, an unwillingness to seek help, and opting to deal with low grades on their own. In 2001, Light published a synthesis of findings from years of research he conducted among more than 1600 undergraduates at Harvard University. His research ascertained which student choices optimize their educational experience; he related what students view as effective educational practices that could be used by campus leaders and faculty members. He supported recent findings on the experiences that increase student engagement: working in small-groups with students and faculty, types of assignments given in classes, student

study habits, and faculty-student interactions. Light (2001) discussed the importance of study outside the classroom stating, “How students study and do their homework assignments outside of class is a far stronger predictor of engagement and learning than particular details of their instructor’s teaching style” (p. 50).

Now in its fourth year of administration, the measurement of student engagement by NSSE is being applied to explore related issues at institutions of higher education. Hicks and Lerer (2003) utilized portions of the NSSE results to measure retention at one particular university. Despite their findings that social integration did have a significant effect on the decision to remain in school, they point out that since the NSSE is distributed in the spring semester, the survey excludes first-year students who have already dropped out. Therefore, research on the NSSE, including this proposed study, needs to be cautious since the students who presumably were the least engaged are no longer are enrolled” (Hicks & Lerer, 2003).

#### *Engagement Survey Benchmarks*

As previously discussed, the National Survey on Student Engagement (NSSE) is the survey instrument currently used nation-wide to measure student engagement and the survey of this proposed study. This section of the review of literature will focus on the five “benchmark” subject areas of the NSSE: (a) Level of Academic Challenge, (b) Active and Collaborative Learning, (c) Student-Faculty Interaction, (d) Enriching Educational Experiences, and (e) Supportive Campus Environment. NSSE refers to the combination of these measurements as “student engagement” (Hayek & Kuh, 2002).

*Level of academic challenge.* Survey items of the NSSE for the “level of academic challenge” benchmark include topics such as the number of hours spent

preparing for class, the number of textbooks read and papers written, emphasis of coursework, and campus emphasis on studying. Light (2001) and Astin (1993) found that the types of courses affect a student's academic experience. Both reported, for example, that students react positively to courses in writing and science. Astin (1993) disclosed that students interviewed in his study reported growth in general knowledge, critical thinking, and public speaking from participating in writing skills courses. Interactions in the classroom improved problem solving skills as well as intellectual skill development when compared to the more traditional lecture approach (Pascarella & Terenzini, 1991). Pascarella and Terenzini (1991) reported that “student critical thinking may be enhanced by teacher classroom behaviors that foster active student involvement in the learning process at a rather high level of interchange between student and teacher and between student and student” (p.146.).

Light (2001) revealed a correlation between the “amount of writing required in a course and the student's overall commitment” (Light, 2001, p. 52). Astin (1993) concluded that students completing math and science courses perceived growth in analytical thinking and problem solving skills. And finally, Light (2001) reported that first-year students who chose large lectures in an attempt to get their general education requirements completed early in their education rarely experienced engagement with a faculty member, did not benefit from working with fellow students in small groups, and did not learn much about the discipline. Students enrolled in small classes, on the other hand, reported experiencing stronger student engagement.

Wilkie (2000) performed a study that examined student's preference for classroom environments. Students who perceived a class to have a positive environment

were found to have higher attendance records and a higher level of satisfaction with the course. Positive correlations were found between student satisfaction and levels of involvement. Students who perceived a classroom environment to be teacher-controlled and competitive were likely to have high levels of absenteeism. This study concluded that students have a preference for environments that are supportive, with faculty who are available and content that is relevant (Wilkie, 2000).

As mentioned earlier, Tinto's early work in the 1970s and 1980s examined the relationship between student involvement/integration and retention. His more recent work focused on learning communities. Tinto (1997) referred to classrooms as small communities in which student engagement is at the center. For new students in particular, engagement in the community of the classroom becomes a gateway for subsequent student involvement in the larger academic and social communities of the college. Tinto, together with MacGregor and Holland, (2000) posited that learning communities provide a forum for effective student-to-student interaction, as well as faculty-to-student interaction. They explained how these environments foster academic and social engagement among peers. More time is spent on academic endeavors, such as studying and working together on projects, resulting in "heightened quality of effort" and "persistence to the following term" (p. 88).

*Active and collaborative learning.* The "active and collaborative learning" benchmark includes questions about classroom behavior, tutoring other students, the number of pages in students' papers, and discussing ideas with others outside of class. One of the first advocates for an active learning environment was John Dewey more than 60 years ago (Hendrikson, 1984; Kezar, 2000). A growing body of research, building on

Dewey's (1938) pioneering studies, indicated the effectiveness of active learning approaches (Hendrikson, 1984).

Research on active learning reports beneficial outcomes including: improved academic achievement, increased graduation rates, improved self-esteem, and better relationships with peers (Astin, 1993; Kezar, 2000; Springer, 1997). Pascarella and Terenzini (1991) reported that when active learning practices are compared to passive techniques, active learning results in enhanced learning and improved retention.

Classroom approaches that involve an exchange of ideas and discussions, for example, have proven to be more appropriate for students' long-term memory (Feldman & Paulsen, 1994). Chickering and Gamson (1987) posit that in order for students to learn they need to be actively engaged with the material. Students should discuss, write, and actively think about the material they are attempting to learn so that they can relate it to their past experiences, thus coming to perceive that it is relevant to their own lives and worthy of being retained. Sorcinelli (1991) reported that active learning is superior to passive settings "when higher-level cognition or affective learning is the goal" (p. 14).

Active learning can occur in a variety of ways both in and out of the classroom. Internships, service projects, and research studies are examples of active and potentially meaningful experiences that ask students to apply what they have learned. Lectures are not completely excluded from active learning environments. There are times when students need to be introduced to the subject matter and provided facts and information (Schomberg, 1986). Still, the preponderance of recent literature proposes that environments rich with active participation "make a positive, often profound difference in fostering student success" (Pascarella & Terenzini, 1991, p. 457).

Collaborative and cooperative learning are terms often used interchangeably, but they are sometimes distinguished as follows: cooperative learning entails students working together in small groups under the guidance of an instructor. Collaborative learning is different in that students can work together to develop knowledge independently of the teacher (Cross, 1998a). Chickering and Gamson (1987) report that collaborative learning allows a student to share his/her own ideas and respond to others, resulting in improved thinking and deeper understanding. Sorcinelli (1991), in her review of research, reports that collaborative learning increases social support, improves self-esteem, fosters positive relationships among peers, and improves social support networks. In addition, collaborative learning has been correlated with gains in cognitive and affective levels and improved attitudes toward diversity (Kezar, 2000).

Cooperative learning has a degree of structure. It entails more than just placing students in groups. Its basic elements include: positive interdependence among group members, face-to-face group interactions, individual as well as group accountability, and appropriate use of interpersonal and small group skills (Feldman & Paulsen, 1994; Johnson et al., 1991). Cooperative learning groups or learning communities provide students with opportunities to develop supportive networks that help to integrate them both socially and academically. Cooperative learning manifests and capitalizes upon an intellectually enriching environment in which students encounter a variety of perspectives beyond the views of one author or course instructor. (Feldman & Paulsen, 1994; Johnson et al., 1991; Pascarella & Terenzini, 1991).

The research reported beneficial learning outcomes from this type of teaching including greater academic achievement, better problem solving skills, improved self-

esteem, and better relationships with peers (Johnson et al., 1991; Springer, 1997). It is an opportunity for active involvement with peers and faculty, while meeting the needs of individual learners and providing the benefits of a small class when one is not an option.

Research on the benefits of learning in a small group format reported that it fosters improvement not only in academic achievement but in other developmental areas as well, such as self-confidence, leadership skills and other personality variables (Feldman & Paulsen, 1994; Johnson et al., 1991; Kezar, 2000). Pascarella and Terenzini (1991) and Light (2001) reported that learning groups provide a means for students to become more academically and socially involved with an increase in their learning. They become more involved with their peers resulting in the development of bonds with social groups and then the college itself. Pascarella and Terenzini (1991) also reported that students who experience this type of collaborative learning have more positive views of the academic institution and a sharper perception of the quality of their learning.

Learning communities have become increasingly popular over the past decade, their development founded on the concepts of active and cooperative learning. Learning communities are a restructuring of the curriculum so that students have related, integrative experiences, which occur in connected educational settings with a common group of students. Common models used have included course clustering, linked courses, and living-learning communities. All attempt to integrate knowledge among the educational components. Learning communities attempt to improve the quality of intellectual interaction among students and between students and faculty. They also attempt to provide a level of coherence and sense of community as well as academic and social involvement (Kellogg, 1999). Cross (1998b) reported, that members of learning

communities “are significantly more likely than their less involved peers to show growth in intellectual interests and values, and apparently more likely to get more out of their college education” (p. 7).

*Student-faculty interaction.* This NSSE benchmark includes talking to faculty about grades, career plans, or ideas from class, working with faculty and receiving feedback from faculty. When examining students’ satisfaction with their college education, researchers consistently find student-faculty interactions to be crucial (Astin 1993; Kuh, 2001a; Pascarella & Terenzini, 1991). Astin (1993) reports that “next to the peer group, the faculty represent the most significant aspect of the student’s undergraduate development” (p. 410). His research findings reveal that satisfaction with faculty has a positive correlation with “hours per week spent with faculty outside of class, having a class paper critiqued by an instructor, and being a guest in a professor’s home” (Astin, 1993, p. 282). In addition, “student-faculty interaction also has positive correlations with every self-reported area of intellectual and personal growth, as well as with a variety of personality and attitudinal outcomes” (p. 383).

Researchers consistently find that student-faculty interaction is most effective when it occurs both in and out of the classroom. Academic engagement occurs when a relationship grows between students and their faculty (Astin 1993; Pascarella & Terenzini, 1991). Light’s (2001) research reported that students believe they benefit academically and report increased satisfaction from activities that involve faculty members and students working together. Student-faculty interaction that is academic in nature impacts the student’s academic outcomes. Examples include working with a faculty member on research, being involved in working on a paper or project, and the

actual hours per week a student spends meeting and talking with a faculty member (Astin, 1993; Light, 2001; Pascarella & Terenzini, 1991; Tinto, 1993).

Pascarella and Terenzini (1991) stated,

We hypothesize that when faculty are committed to creating quality learning experiences, when they are consistent in showing respect, caring and authenticity, and when they are willing to interact with students in a variety of settings, then development of competence, autonomy, purpose and integrity is fostered (p. 316).

Influential faculty are caring, engaged, experienced, competent, and able to share knowledge and experiences, while at the same time still assessing student competence (Chickering & Reisser, 1993; Pascarella & Terenzini, 1991). Students who reported having the highest degree of cognitive development perceived the faculty to have a genuine concern for their learning and their teaching, had a close, influential relationship with at least one faculty member, and were influenced by their interactions with their peers.

As stated, the research also asserted that students benefit academically from interaction between themselves and faculty when it occurs both in and out of class (Astin, 1993; Light, 2001; Pascarella & Terenzini, 1991; Tinto, 1993). Pascarella and Terenzini (1991) reported that many studies, dating as far back as the 1950s, revealed that student-faculty contacts outside of class have a positive relationship to college satisfaction, cognitive and social development, academic achievement, and persistence. They report that academic engagement is enhanced when a relationship is developed with a faculty member.

Pascarella and Terenzini (1991) found that non-classroom interactions, that had the most impact on students, were ones that integrated the students' classroom and non-classroom experiences. When student-faculty interactions occurred outside of the classroom, they impacted students' values and attitudes. In addition, informal contact with faculty was linked with intellectual growth, growth in autonomy and independence, and improved interpersonal skills. Interactions with faculty also strengthened bonds between the student and the institution resulting in better persistence (Astin, 1993). Pascarella and Terenzini (1991) stated that the type of interaction matters. They speculated that for interactions to have a positive effect they must be more than superficial; they must be of high quality and meaningful for students, i.e. engaging in the classroom but also accessible to students outside of class.

Nevertheless, Pascarella and Terenzini (1991) warned of possible weaknesses in the literature on student-faculty interaction and involvement. They reported that high achieving students may have well-established skills prior to college entry that facilitate the ability to become more involved. They identified limitations of the research on student-faculty interactions, asserting that it is possible that "students with initially high educational aspirations are most likely to interact socially with faculty and that such interaction serves to enhance further initial aspirations" (p. 394). In sum, interaction with faculty has an important and perhaps a key role in the education of students as demonstrated by the review of the literature on classroom practices and student involvement and their positive relationship to outcomes. Unfortunately, both classroom and out-of-classroom interactions with faculty tend to be formal, structured interactions

that usually occur in traditional settings and do not lead to student involvement (Braxton, 2000; Chickering & Gamson, 1987; Pascarella & Terenzini, 1991).

Richard Light's (2001) qualitative research on undergraduate education revealed that students who interacted with faculty members and other students had more positive attitudes about their educational experiences. Students reporting little or no "positive experience" also expressed themselves as feeling isolated from their college community, stating that they were not involved in college activities and tended to study independently. These students described themselves as unwilling to seek help from faculty.

Cross (1998a) summarized research demonstrating that students who have frequent interactions with faculty members both in- and out-of-class are more satisfied with their education, are less likely to leave college, and perceive themselves to have learned more than students who did not have this experience. Kuh's theory of academic engagement and Astin's theory of student involvement, as previously discussed, provide the conceptual framework for this practice. Contact between students and faculty, through discussion and the sharing of ideas, results in enhanced intellectual commitment. Projects such as independent studies, which ask students to work with faculty, contribute to an increase in student satisfaction with their academic experience (Chickering & Gamson, 1987; Light, 2001).

In sum, student-faculty interaction has a strong impact on many educational variables in higher education. Large-scale correlational studies reported that when students have frequent contact with faculty both in and out of class, they are more satisfied with their education, have lower attrition rates, and perceive that they have

learned more than students who have had less contact (Cross, 1998a; Pascarella & Terenzini, 1991). When social interaction occurred between students and faculty, it positively affected educational aspirations and subsequent higher educational attainment (Astin, 1993). Tinto (1993) reported that the development of academic and extra-curricular programs may be beneficial but cannot replace the value of high quality, caring faculty and staff.

*Enriching educational experience (both in and outside the classroom).* Questions on the NSSE related to “enriching educational experience” include items such as participating in co-curricular activities, community service, independent studies, study abroad, and contact with students from different backgrounds or with different beliefs. It is well established in the research that the more meaningful learning is to students, the more successful they are. “Skills are most effectively learned in a context that gives meaning to those skills” (Tinto, 1993, p.183). Research on cognitive development reported that students learn new information and conceptual skills more easily when acquired in a meaningful context, whether personal or experiential (Feldman & Paulsen, 1994; Pascarella & Terenzini 1991).

Concerning experiences outside the classroom, social engagement in the literature has been measured by the amount of time and influence extra-curricular activities, peer relationships, living on campus, and college services have on academic outcomes. Light (2001) and Astin (1993) reported that there is a relationship between out-of-class activities and academic success and student satisfaction. Pascarella and Terenzini (1991) found that there is a statistically significant relationship, for both men and women, between social participation and educational attainment.

Pascarella and Terenzini (1991) reported in their review of the research that living on campus as opposed to commuting facilitates social involvement. They also reported that attending a large institution, as opposed to a small one, results in an inhibiting influence on social involvement. In sum, involvement increases as a student feels more a part of the campus community.

Both Astin (1993) and Light (2001) reported the importance of relationships with student peers in the academic experience of an undergraduate. Light's (2001) research emphasized the importance of peers studying together in small groups, reporting that students find this beneficial, engaging, and conducive to better academic preparation. According to Astin (1993), "the student's peer group is the single most potent source of influence on growth and development during the undergraduate years" (p. 398). Astin (1993) asserted that student-to-student interaction is positively correlated with self-reported growth in leadership variables, overall academic performance, analytic and problem solving skills, critical thinking, cultural awareness, preparation for graduate and professional school, and general knowledge. Correlations with specific academic outcomes include "degree aspirations, college GPA, graduating with honors, scholarship, social activism" (p. 385).

Pascarella and Terenzini (1991) reported that student interaction with peers has a positive influence on intellectual development and orientation, political and social values, interpersonal skills, and educational aspirations and attainment. They concluded that "both the frequency and quality of students' interactions with peers and their participation in extracurricular activities are positively associated with persistence" (p. 110). Peer interaction provides students an opportunity to interact and develop relationships with

other “achievement oriented peers,” thus fostering and reinforcing high aspirations and educational goals. It also develops personal resources to support their endeavors (Pascarella & Terenzini, 1991, p. 411).

In sum, the research supports the importance of social involvement. Student learning is a result of effort spent in becoming both more academically and more socially involved (Pascarella & Terenzini, 1991). Social involvement also ultimately effects degree attainment. Theoretical models posit that the more socially integrated students are, the stronger their bonds are to the institution; thus the more likely they are to persist to degree completion.

*Supportive campus environment.* This last benchmark includes items on the NSSE such as relationships with other students, faculty, and administrators, as well as academic and non-academic support from the campus environment. Chickering and Gamson’s (1987) review of the literature on teaching practices outlined the benefits of attempting to meet the needs of individual learners. Students arrive at college with differing and various past experiences, knowledge bases, aptitudes, and exposures to different styles of learning. Over the years, student programs and services have become increasingly sensitive to this diversity.

In the area of teaching and learning, for example, Howard Gardner (1983, 1999) identified eight types of aptitudes or intelligences that are beyond the customary areas of the linguistic and numeric (aptitudes predominately valued in traditional educational settings). Originally, he was interested in music and the other arts as intelligence factors. His definition of intelligence has evolved over the years to be understood as bio-psychological potentials, which include linguistic, logical-math, spatial, bodily-

kinesthetic, musical, interpersonal, intrapersonal, and naturalistic (Gardner, 1999). His theory can be a tool when approaching learning in a supportive campus environment. Professors can approach their topic in many ways, thereby activating different intelligences within a single student or throughout a classroom of students, each with their own dominant intelligence from his taxonomy.

Another factor in meeting the needs of individual learners is the concept of learning style. Despite reported difficulty in its definition and assessment (Sorcinelli, 1991), knowledge of different learning styles has been helpful both in and outside the classroom. For instance, Sorcinelli reports research that suggests deeper understanding of one's own learning style can improve academic performance. In sum, faculty who respect diverse "interests and talents are likely to facilitate student growth and development in every sphere – academic, social, personal and vocational" (p. 21).

Another area of student support on campuses which has been developing in recent years is the area of programming related to assisting new students in their transition and adjustment to higher education. John Gardner (1996) has led the first-year experience "movement" across the nation for 30 years, with special emphasis on improving the first-year experience. The first-year experience movement focuses on issues such as racial and ethnic diversity, academically under-prepared students, lack of social and self-management skills, and in general attrition in undergraduate education (Barefoot & Fidler, 1992, 1996; Fidler, 1991; Fidler & Henscheid, 2001; Fidler & Moore, 1996).

One main concern in the first-year is first-generation college students primarily because higher education is a culture that no one in their family has ever experienced. Among many recommendations for first-generation students, Gardner (1996)

recommends that attention, time and money be intentionally invested in academic advising as it “yields student success” (p. 31).

Nevertheless, regardless of a student’s parents’ educational level, first-year students in general are struggling in higher education. Research examining the outcomes of first-year programs generally affirms that the investments of time, energy, and fiscal support have paid substantial educational dividends (Barefoot & Fidler, 1992; Dick, 1998; Fidler & Moore, 1996; Fidler, Neurerer-Rotholz & Richardson, 1999; Hoff, Cook & Price, 1996; Ness, Rhodes & Rhodes, 1989; Starke, Harth & Sirianni, 2001; Wilkie & Kuchuck, 1989; Yockey & George, 1998). These programs, which include orientation, first-year seminars, first-year advising, and learning communities (Crissman, 2001; Upcraft, Gardner & Associates, 1989), combine academic curriculum and student services for first-year students, ease their transition, and decrease attrition from first year to sophomore year while improving persistence to graduation.

In sum, this last section of the review of literature offers a comprehensive overview of the following proposition: improved educational outcomes and student development emanate from a broad range of student involvement in their own education. When students perceive that they are invited into the process, they respond with increased academic and social engagement. Motivated, with their enthusiasm over the results, students do better academically, become further engaged and persist in their college experience. In other words, learning begins with pedagogies of engagement (Edgerton, 1997) and ends with new engagements (Shulman, 2002).

*Summary*

In summary, an examination of the philosophical purposes of education, in both learning and assessment, leads to an interest in engagement as product and process. From the history of outcomes assessment in higher education it is evident that the NSSE has become the survey tool to measure student engagement and guide improvements in student learning and development. However, given the low response rates to the NSSE 2000 through 2004, it is essential to question, as reported in the literature, the validity and generalizability of the results. In addition, NSSE participating universities are not hearing from over 50% of their student population. Evidence from the review of the literature also supports the concern for nonresponse bias in such situations. NSSE administrators did report one national nonresponse bias test in 2001. Nevertheless, to date no local NSSE follow-up nonresponse bias studies, for individual participating universities, have been reported in the literature. Therefore, more studies are needed to assess the external validity of the NSSE results, not only nationally but especially at the local level. This study makes one such local contribution.

The findings of this literature review provide useful baseline information for future research related to the survey error of nonresponse bias and survey response as well as undergraduate student engagement and assessment. The following chapter explains the methodology that was used to conduct a nonresponse bias follow-up test comparing the survey results and socio-demographic variables between first-year respondents and first-year non-respondents at one National Survey of Student Engagement 2004 participating university.

## CHAPTER THREE

## Methodology

The purpose of this study was to measure nonresponse bias of first-year undergraduate students in National Survey of Student Engagement (NSSE) 2004, (Indiana University Bloomington, 2003) at an independent comprehensive Catholic university in northeastern Pennsylvania. The review of the literature, in the previous chapter, built a case for the argument that non-respondents often tend to differ from respondents on features significant to the purpose of a study (West, 1991). For purposes of this study, nonresponse bias is defined as a bias that exists in the results when respondents to a survey are different from those who did not respond in terms of demographic or attitudinal variables, or other variables relevant to the survey topic (DDS Research, Inc., 2004).

*Research Design*

This was a measurement study with a local over-sample design, comparing first-year respondents to first-year non-respondents. The primary objective of this study was to compare the participating university's NSSE 2004 results (the first-year respondents = independent group one) to the survey results of the students who participate in the present study (the participating university's NSSE 2004 first-year non-respondents = independent group two) in order to measure nonresponse bias. Another objective was to compare socio-demographics of the two groups. Two types of statistical tests were used in this study to analyze nonresponse bias: (1) independent sample *t*-tests for independent means, and (2) chi-square goodness-of-fit tests for nominal data. First, *t*-tests and chi-square tests were conducted to compare first-year respondents and first-year non-respondents on

seven socio-demographic variables. Frequencies were also run on appropriate variables. Next, following the statistical approach of Zhao, Kuh, Carini and Bunnage (2002), independent *t*-tests compared first-year respondent and first-year non-respondent engagement means of each of the five NSSE engagement scale individual item means, as well as the individual survey item means for the two groups. The scale means for this study were calculated directly from the survey results on SPSS and are not comparable with the scale (termed Benchmarks by NSSE) *scores* [italics added] reported to the 2004 NSSE participating universities. The NSSE engagement scales' scores are weighted adjusted means, converted to a 100-point score, for comparison at the institutional level (National Survey of Student Engagement, 2003a). Finally, additional analyses were run on the non-scale individual survey items to test for nonresponse bias and compare levels of student engagement.

### *Materials*

The materials used for this study included the official results of the NSSE 2004 from the university under study, the list of first-year non-respondents from the NSSE 2004, sufficient copies of *The Report* (see Appendix A), survey envelopes to participants (see Appendix B), cover letters to the nonresponse survey participants (see Appendix C), their consent forms to participate in the study (see Appendix D), pre-paid incentive \$5 telephone calling cards (see Appendix E), pre-survey post-cards (see Appendix F), a pre-survey email message (see Appendix G), post-survey follow-up letters and follow-up email message (see Appendix H), and a post-survey thank-you note (see Appendix L).

*Instruments and Data*

In order to measure nonresponse bias, data were collected on socio-demographic characteristics of the student participants available from the participating university's records and empirical data collected by a national survey instrument. Permission to survey the students was granted by the Deans of the participating university's four colleges (Appendix I). Permission to use the students' socio-demographic data and NSSE 2004 results was granted by the participating university's Office of Planning and Institutional Research (see Appendix J).

The survey instrument was the NSSE's *The College Student Report 2004* (see Appendix A). Permission to use the student survey was granted by the NSSE Office at Indiana University Bloomington's Center for Postsecondary Research (see Appendix K).

*The College Student Report 2004 (The Report)*. Student engagement at the university (that is, the degree to which students report participation in effective educational practices) was quantitatively measured and descriptive data, including socio-demographic information about the participants, were gathered using a national survey entitled *The College Student Report 2004 (The Report)* (Indiana University Bloomington, 2003). Designed by national assessment experts, as discussed in Chapter Two of this proposal, this instrument consists of approximately 100 questions in a self-report format whose design satisfies the five general criteria that promote valid self-reports (Kuh, 2001b). Many of *The Report's* items have been used in other undergraduate surveys including Indiana University's *College Student Experiences Questionnaire* (CSEQ) (Kuh, Vesper Connolly, & Pace, 1997; Pace, 1984, 1990) and UCLA's *Cooperative*

*Institutional Research Program (CIRP)* (Astin, 1993; Sax, Astin, Korn & Mahoney, 1997).

The majority of the survey questions refer specifically to student behaviors that, according to prior research, correlate with positive learning and personal development outcomes of attending university (Chickering & Gamson, 1987; Kuh, 2001b). The survey also asks students for socio-demographic information on gender, race/ethnicity, residence status, major and parents' educational level, which were utilized in this survey as intervening variables.

Approximately half of the questions of *The Report* are assigned to one of five National Benchmarks of Effective Education Practice. They are: (a) Level of Academic Challenge, (b) Active and Collaborative Learning, (c) Student-Faculty Interactions, (d) Enriching Educational Experiences, and (e) Supportive Campus Environment (see Appendix M). To make it easier to compare student performance across institutional sectors, types, size and so forth, the benchmarks were created on equal 100-point scales. Zero is the lowest score and 100 the highest score (National Survey of Student Engagement, 2000). Subsequently, for purposes of clarity, these "benchmarks" throughout this proposal are termed "scales."

NSSE research specialists describe the contents more specifically in a recent study report (Carini, Hayek, Kuh, Kennedy, & Ouimet, 2003):

*The College Student Report* taps student experiences on several dimensions: (a) involvement in different types of in-class and out-of-class activities, (b) taking part in educationally enriching programs such as study abroad, internships, and senior

capstone courses, (c) perceptions of collegiate contributions to educational, personal, and social development, (d) perceptions of the campus environment, such as institutional emphases and quality of relationships on campus, and (e) satisfaction with their overall institutional experience. In addition, students give background information, such as their sex, age, race/ethnicity, enrollment status, living arrangements, and major field (Carini, et al., 2003, p. 4).

The results of the student survey are forced choice answers, in Likert-scales of either three, four, five or seven items. NSSE results are analyzed in two ways: (a) by each individual survey question and, (b) by each scale separately. Nevertheless, the NSSE researchers have found that “students who are engaged at a reasonable level in all areas gain more than do those who are engaged in only one or two areas” (National Survey of Student Engagement, 2000, p. 4).

Psychometric properties of *The Report* have been tested and reported in various sources (Kuh, 2001b; Kuh, Hayek et al., 2001; Ouimet, Carini, Kuh, & Bunnage, 2001). Given that the instrument relies on the process of self-report, *The Report* from the beginning was designed to meet the five conditions under which self-reports are likely to be valid. These five conditions are extensively discussed in Chapter Two of this proposal.

*Validity and Reliability*

Concerning validity of the instrument itself, the designers of *The Report* spent considerable time “making certain the items on the survey were clearly worded, well-defined, and had high face and content validity” (Kuh, 2001b, p. 5). In addition, as

recommended by Kerlinger (1973), they used factor analysis to establish construct validity (Kuh, 2001b).

During the initial roll out phase of *The Report*, focus groups were held (Ouimet et al., 2001) to clarify how students interpreted the various survey items and what they meant by the different response categories. “The results of these focus groups were used to increase the clarity and measurement precision of *The Report*, thereby increasing the instrument’s validity and reliability” (Ouimet et al., 2001, p. 16).

Since the first year of the survey in 1999, the NSSE designers have conducted psychometric analyses following all administrations of the instrument nationwide (Kuh, 2003). Spearman’s rho correlations for the five scales were calculated using the aggregated institutional level data. In addition, “the overall test-retest reliability coefficient for all students ( $N = 569$ ) across all items on *The Report* was a respectable .83” (p. 16), indicating a fair degree of stability. In sum, these and other tests show that the vast majority of the items on *The Report* is valid and reliable and have acceptable kurtosis and skewness indicators (Kuh, 2003).

### *Participants*

The population of this study was all first-year students attending the participating university in the school year 2003-2004. The potential participants of this study were the first-year non-respondents of the participating university’s NSSE 2004 ( $n = 94$ ). The participants were the student who filled-out and returned the survey providing data for analysis to conduct this nonresponse bias study ( $n = 25$ ). This was a nonprobability sample of convenience (Kalton, 1983).

Despite the fact that the participants of the NSSE 2004 include both first-year and senior year students, only the first-year non-respondents were participants in this proposed study. This decision is in line with recent NSSE research procedures (Zhao, Kuh, Carini & Bunnage, 2002), that analyze data from first-year and senior students separately based on the results from other studies that “indicated that these two groups have distinctly different behavioral patterns (Feldman & Newcomb, 1969; Pascarella & Terenzini, 1991)” (as cited in Zhao et al., p. 8).

#### *Procedures*

Before this study was initiated, its proposal was reviewed by the Institutional Review Board (IRB) of the participating university. This procedure was aimed at insuring that all participants were protected and to prevent any potential harm or ethical violations from occurring during the research.

Upon acceptance by the IRB, the socio-demographic student data on the first-year respondents and first-year non-respondents were gathered from the participating university’s records through the Office of Planning and Institutional Research. It was coded appropriately for statistical analysis using SPSS software.

#### *Multi-Stage Follow-Up Process*

Following the survey design and administration system of Don Dillman’s Total/Tailored Design Method (1978, 1991, 2000), communication with this study’s participants was conducted, over approximately a 40-day period, in several follow-up stages and procedures with personal appeals to the students. As clarified by a member of the Dillman research team at Washington State University (Danna Moore, personal email communication September 8, 2004), the goal of conducting diverse types of follow-up

procedures is to increase response rates and obtain close to 100% of the surveys distributed to the student participants (Moore & Tarnai, 2002). More realistically, the researcher hoped for a response rate that follows the advice of the survey methods experts outlined in Chapter Two, that is, one which approximated the 47% response rate of the university's NSSE 2004 survey (John Tarnai, personal email communication September 8, 2004; Barbara Sadowski, personal email communication September 17, 2004).

Stage One was a pre-survey post-card alerting the non-respondent to the upcoming survey request (see Appendix F). Street address errors were corrected where possible for each "return to sender" postcard. Stage Two was an email with the same message to those non-respondents who had an email address (see Appendix G). Email address errors were corrected where possible for each returned email.

Communication for Stage Three was through the public mail system. In Stage Three, the packet mailed to each potential survey participant included numerous research-based techniques proven to increase response rates in mail surveys. First, the survey mailing envelope (see Appendix B) had each participant's address printed on the envelope as recommended by Dillman (1978) with a postage stamp applied by hand instead of a metered postage (Fox, Crask, & Kim, 1988; Yammarino, Skinner, & Childers, 1991). Each packet included a copy of *The Report* (see Appendix A), a cover letter of introduction (see Appendix C), and a survey participation consent form for all participants to read and sign (see Appendix D). The cover letter included the purpose of the study, as well as the importance of student engagement and the implications of the study results, all explained in the personalized style recommended by Dillman (1978, 1991, 2000). Application of Dillman's personal appeal included emphasis on the

students' sense of expertise on their own college experience, as well as the importance of each individual respondent. Specifically, the letter emphasized that students' participation and responses will not influence their relationship with the university nor any department thereof. In addition, to encourage a prompt response, a return date was fifteen days from the mailing date and an addressed stamped envelope was included in the survey packet. The completed surveys and the consent forms were sent to the researcher.

Also explained in the cover letter and the consent form was an explanation of the pre-paid incentive offered for completing and returning the survey: a \$5 phone card (see Appendix E). This incentive procedure is based on the financial incentive study by Armstrong (1975), by a review of several TDM financial incentive studies (Dillman, 1991), and more recent incentive research on students (Porter & Whitcomb, 2003, 2004) where, in general, prepaid incentives made small to significant differences.

The consent form (see Appendix D) further outlined any possible risks and benefits, and explained that the study was voluntary, the participants could terminate their participation at any time, and that all information would be confidential (Creswell, 2003; Groves, Fowler, et al., 2004). All survey participants were required to sign and return the consent form, agreeing that they fully understood the purpose and procedures of the study that they knew they could voluntarily withdraw from the study at any time, and that their confidentiality was protected.

One week after the survey mailing, Stage Four was a follow-up letter reminding and encouraging the participants to fill-out and return the survey (see Appendix H). Its

content was similar to the original cover letter (Creswell, 2003; Dillman, 1978, 1991, 2000). The letter was mailed and emailed to survey non-respondents.

The survey administration time period officially ended one month after the initial surveys were distributed. On that day, the researcher began to score the surveys according to the official NSSE 2004 code book.

The final and Fifth Stage consisted of a “thank-you” note (see Appendix L), bringing closure to the “social exchange” concept, upon which Dillman’s TDM system for survey administration is based (1978). The note specifically addressed the appreciation of the researcher for the students’ time and interest in contributing to the study.

#### *Data Analysis*

The purpose of the data analysis was to ascertain whether there is nonresponse bias among first-year undergraduate students in the results of the NSSE 2004 data collection at an independent comprehensive Catholic university in northeastern Pennsylvania. The response rate, by the original non-respondents, was 26.6%, that is 25 of the original non-respondents ( $n = 94$ ) filled out and returned the survey for this nonresponse bias study.

#### *Variables*

The dependent variable was the students’ engagement in college. This variable was operationally defined by the five engagement scales of the NSSE’s survey instrument, *The College Student Report 2004 (The Report)* (see Appendix A).

The quasi-independent variable was first-year students' response status (respondent or non-respondent) to NSSE 2004, the result of the students' choice in the spring semester of 2004 whether or not to fill-out and return the *The Report*.

For this nonresponse bias study, there were a number of intervening demographic variables that assisted in measuring nonresponse bias. Those variables included gender, race, first-year place of residence, first-year grade point average (QPA), major, and parents' educational level.

#### *Analysis Procedure*

First, to test representativeness, a comparison of socio-demographic variables was made between the present study's respondents and the entire university original non-respondents. Independent sample *t*-tests compared the study respondents and non-respondents according to first-year grade point average (QPA). Chi-square goodness-of-fit tests compared nominal data on socio-demographic variables. Summary tables of both these statistical comparison tests are included in the text of Chapter Four with accompanying narrative.

Second, the researcher analyzed socio-demographic characteristics of the NSSE 2004 respondents and non-respondents, gathered from the participating university's records as well as the completed surveys. The demographic information describing the two groups is presented, in the following chapter, in a summary table and in the text with descriptive accompanying narrative. This summary table, as well as additional tables and graphics describing the quantitative data of this study, were designed so that complex ideas were communicated with clarity, precision, and efficiency (Tufte, 1983).

The researcher also gathered the NSSE 2004 results from the participating university. The survey mean scores were examined by survey question and according to each of the five NSSE engagement scales. The researcher ran the complete data analysis using SPSS computer software.

Next, the data from the survey were analyzed by independent sample *t*-tests for independent means, comparing first-year NSSE 2004 respondents to the first-year non-respondents. Means and standard deviations were computed and compared to see if the engagement experiences of the non-respondents differed from the respondents. The results were at the interval level of measurement. The independent variable was respondent status type (coded as 0 = respondent, 1 = non-respondent). The dependent variables were the five engagement scales' scores. Underlying assumptions of the *t*-test were analyzed in terms of the survey data. Tests to measure normality and the variation of scores were run, examining both skewness and kurtosis. Appropriate frequency distributions and histograms were also run. Their results are described in Chapter Four. Summary tables comparing the various means and standard deviations of the respondents and non-respondents are included in the text with accompanying narrative.

Independent sample *t*-tests also compared the respondents and non-respondents on interval socio-demographic data. Chi-square goodness-of-fit tests compared nominal data on socio-demographic variables. Summary tables of *t*-test comparison tests are included in the text with accompanying narrative.

The plan for additional analyses included statistical analyses performed to investigate the interaction of several of these variables if deemed necessary. Instead, the additional analyses focused on the NSSE non-scale individual survey items.

*Research Hypotheses*

The main question to be addressed in this study is: What is the evidence that nonresponse bias exists for first-year undergraduate students in the results of the NSSE 2004 data collection, at an independent comprehensive Catholic university in northeastern Pennsylvania? To answer this question, the following null hypotheses, and the corresponding hypotheses, were tested:

H0 1) There will be no significant differences found between the NSSE 2004 first-year non-respondents and the first-year respondents on socio-demographic variables, such as gender, race, first-year place of residence, first-year grade point average (QPA), major of study, and parents' educational level.

Ha 1) There will be significant differences found between the NSSE 2004 first-year non-respondents and the first-year respondents in socio-demographic variables, such as gender, race, first-year place of residence, first-year grade point average (QPA), major of study, and parents' educational level.

Null Hypothesis One and Research Hypothesis One were tested using independent sample *t*-tests for interval data and chi-square goodness-of-fit tests for the nominal data.

H0 2) There will be no significant difference found between the NSSE 2004 first-year non-respondents and the first-year respondents in mean engagement scores on each of the five NSSE National Benchmarks of Effective Education Practice.

Ha 2) There will be a significant difference found between the NSSE 2004 first-year non-respondents and the first-year respondents in mean engagement scores on each of the five NSSE National Benchmarks of Effective Education Practice.

Null Hypothesis Two and Research Hypothesis Two were tested using independent sample *t*-tests for each of the five engagement scales comparing first-year respondents to first-year non-respondents.

### *Summary*

In summary, this study measured nonresponse bias of first-year undergraduate students in the National Survey of Student Engagement (NSSE) 2004, (Indiana University Bloomington, 2003) at an independent comprehensive Catholic university in northeastern Pennsylvania. The survey administration was conducted, over approximately a 30-day period, in a multi-stage follow-up process with personal appeals to the participants. The researcher scored the responses from the surveyed non-respondents according to the official code book of the NSSE Office at Indiana University Bloomington's Center for Postsecondary Research. The researcher gathered the NSSE 2004 results and student socio-demographic information from the participating university. The study tested the research hypotheses by comparing the five NSSE engagement scales' survey results and the student socio-demographic variables between the NSSE 2004 respondents and non-respondents using independent sample *t*-tests and chi-square goodness-of-fit statistical tests. Additional statistical analyses, not originally included in the two research hypotheses, were performed to investigate nonresponse bias on the survey's non-scale individual items. The present study has contributed to the literature on nonresponse bias in the NSSE where only one national level nonresponse bias study had been conducted over the five years of the administration of the NSSE survey (Kuh, 2001b).

## CHAPTER FOUR

## Results

The purpose of this study was to measure nonresponse bias of first-year undergraduate students in the National Survey of Student Engagement (NSSE) 2004, (Indiana University Bloomington, 2003) at an independent comprehensive Catholic university in northeastern Pennsylvania. A measurement study, with a local over-sample design, compared first-year respondents to first-year non-respondents.

The primary objective of this study was to compare NSSE 2004 results (the first-year respondents = independent group one) to the survey results of the students who participated in the present study (2004 first-year non-respondents = independent group two) in order to measure nonresponse bias. Mean comparisons were made of the five NSSE engagement scales, based on individual survey items, for the two groups. The scale means for this study were calculated directly from the survey results on SPSS and are not comparable with the scale scores (termed benchmarks by NSSE) reported to the NSSE 2004 participating universities. The NSSE engagement scales' scores are weighted adjusted means, converted to a 100-point score, for comparison at the institutional level (National Survey of Student Engagement, 2003a).

In addition, differences in gender, race, first-year place of residence, major of study, first-year grade point average (QPA) and parents' (mother and father) education level were assessed for both first-year NSSE 2004 respondents and non-respondents. Descriptive statistics were gathered, including frequencies, means and standard deviations, on the socio-demographic characteristics. Representativeness of this study's respondents to all university non-respondents was also tested. One-sample *t*-tests,

independent sample *t*-tests and chi-square goodness-of-fit tests were completed to test study hypotheses. Lastly, additional nonresponse bias analyses were conducted by comparing responses of the two groups on individual survey items not directly involved in the study hypotheses.

#### *Demographic Characteristics of the Study Respondents*

The non-probability sample of convenience (Kalton, 1983) was derived from a population of all first-year students at an independent comprehensive Catholic university in northeastern Pennsylvania in the spring semester of 2004. Initially, 103 first-year students responded to the university's NSSE 2004 survey (university respondents = UR group) and 94 first-year students did not respond to the university's NSSE 2004 survey (university non-respondents = UNR group). As discussed in Chapter Three, the researcher mailed the 94 university non-respondents the NSSE 2004 survey to conduct the nonresponse bias study. After the month-long series of survey response follow-up steps, 25 (26.6%) of those 94 students responded to this study's survey (study respondents = SR group). Sixty-nine of those 94 did not respond (study non-respondents = SNR group). The frequencies for the discrete demographic variables of the participants, the SR group, are shown in Table 1 below. Frequencies for student major of study grouped by NSSE college categories for the study respondents are shown in Table 2. The mean and standard deviation for the study respondents' first-year grade point average (QPA) are reported in Table 3.

Table 1  
Frequencies of Demographic Variables for Study Respondents

Variable	N	%
<b>Gender</b>		
Male	6	24
Female	19	76
<b>Race</b>		
White	23	92
Hispanic	0	0
African-American	1	4
Asian	1	4
<b>Place of Residence</b>		
On-Campus	10	40
Off-Campus	15	60
<b>Father's Education Level*</b>		
Secondary	11	44
Post-Secondary	9	36
Graduate	4	16
<b>Mother's Education Level</b>		
Secondary	12	48
Post-Secondary	11	44
Graduate	2	8
Total	25	

*Note.* \* Missing one case of 25 total cases.

The study respondents (n=25) were mostly female (76%), and 92% reported to be “white/Caucasian.” One student reported to be African-American and another reported to be Asian. Fewer than half (40%) lived on-campus during the first-year, while the

majority (60%) lived off-campus. All 15 of the students who lived off-campus lived “within driving distance,” with none living “within walking distance.”

As part of the socio-demographic data on the survey, similar education levels for both fathers and mothers were reported. However, one student did not report the father’s education level. Eleven fathers and twelve mothers attended or graduated from high school. More students’ mothers attended or graduated from post-secondary school (n=11), than did their fathers (n=8). Lastly, students reported that more fathers (n=4) received a graduate degree than did their mothers (n=2).

Table 2  
Frequencies of Major for Study Respondents

Major (NSSE College Groups)	N	%
Arts & Humanities	7	28.0
Biological Sciences	1	4.0
Business	5	20.0
Education	5	20.0
Physical Science	0	0.0
Professional	4	16.0
Social Science	2	8.0
Other	1	4.0
Undecided	0	0.0
Total	25	

According to the self-reported college majors on the NSSE survey, the researcher grouped the majors by NSSE’s college categories. The highest number of students (28%) wrote in a major that is included in the Arts and Humanities area. The majors within Business and Education colleges were tied each with 20% of the study respondents. No students reported that they were undecided in terms of a major.

Descriptive data on the study respondents' first-year grade point average (QPA), are shown in Table 3 below, including the mean (2.98), the range from a minimum of 1.87 QPA to a maximum of 3.93 QPA, and standard deviation (.50).

Table 3  
QPA Mean and Standard Deviation of Study Respondents

Group	N	Median	Min.	Max.	Mean	SD
Study Respondents	25	3.02	1.87	3.93	2.98	.50

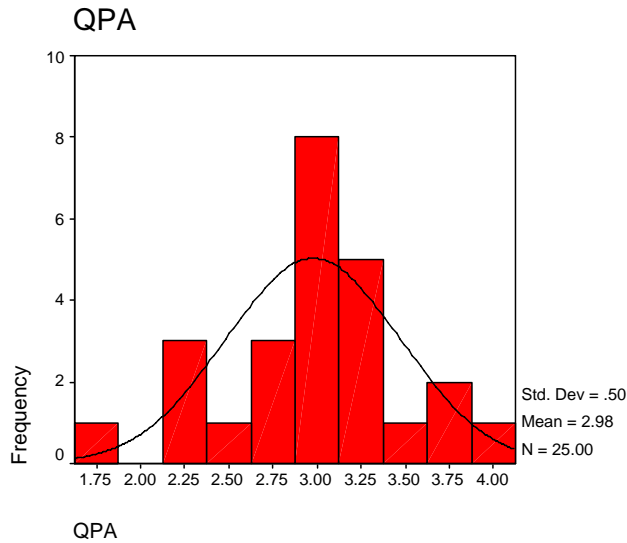


Figure 1: Histogram of Study Respondents' QPAs

The histogram plot of the study respondents QPA (See Figure 1) was assessed for the assumption of acceptable normality. Visual inspection of the curve did not indicate any gross departure from normality.

*Nonresponse Bias Testing*

To assess non-response bias in NSSE 2004 first-year students, statistical analyses were performed with Statistical Package for the Social Sciences (SPSS). The results of the comparison of the first-year respondents and non-respondents' survey responses for

the five NSSE engagement scales and comparison of their socio-demographic factors were analyzed according to the study's two research hypotheses.

The data analysis procedure for research hypothesis one utilized chi-square goodness-of-fit tests and independent sample *t*-tests. Research hypothesis two examined group differences based upon group means by employing independent samples *t*-tests, as well as one-sample *t*-tests. Frequencies and means for the demographic characteristics for all groups were found. The conventional level of significance was set at  $p < .05$  for all tests.

Prior to the data analysis, the assumption of homogeneity of variance was investigated. The two groups were independent. However, the sample non-respondent group was not chosen randomly. The study respondents ( $n = 25$ ) consisted of the first-year students in the NSSE 2004 university non-respondent group ( $n = 94$ ) that filled out and returned this study's survey. The dependent variables (the five NSSE engagement scales) for both groups were assumed to follow normal distribution patterns. Even though the group sizes were unequal, Levene's Test for Equality of Variances statistically demonstrated that the two group's scores of each of these scales had approximately equal variances. Since a *t*-test is robust with respect to violations of the assumption of normal curve distribution when variances are equal, the test of homogeneity of variance was assumed to be sufficient.

After completing the data analyses for the two research hypotheses, further analyses were conducted to gain greater insight into nonresponse bias and differences in levels of engagement between NSSE 2004 respondents and non-respondents. Independent *t*-tests and one-sample *t*-tests, applying the conventional level of

significance of  $p < .05$ , were run, first on the individual survey items associated with each of the five NSSE engagement scale and later on those items not included as part of the scales, to test for non-response bias on those items.

The significant results of the statistical comparisons of the first-year university respondents to the first-year study respondents are presented below through tables, graphics and narrative. Prior to analyzing differences between respondents and non-respondents, the issue of the representativeness of the study respondents needs to be addressed.

#### *Representativeness of Study Respondents to University Non-Respondents*

The premise behind a nonresponse bias study is to measure whether the university respondents ( $n = 103$ ) are representative of the entire population (spring 2004 first-year students) through a series of comparisons within the surveyed population. If representative, then results can be generalized. There are two representative tests in this process. The initial test in this study is to measure whether the study respondents ( $n = 25$ ) is representative, in socio-demographic terms, of the university non-respondents ( $n = 94$ ), of which group they were originally members. The second test, dealing with whether the university respondents ( $n = 103$ ) are representative of all the first-year students of the surveyed university, is measured through the two research hypotheses.

The first representativeness test is important because, later when testing the two research hypotheses, the study respondents ( $n = 25$ ) represent the non-respondent group ( $n = 94$ ). Representativeness is tested first by comparing the data on the study respondents ( $n = 25$ ) to that on the study non-respondents ( $n = 69$ ). [Together, they make up the original NSSE 2004 university non-respondents ( $n = 94$ ).] To determine whether

the differences between these two groups were significant, the chi-square goodness-of-fit test and the *t*-test for independent samples were applied to the data.

*Gender.* A chi-square goodness-of-fit analysis revealed a statistically significant difference between the number of females and males in the two groups employed to test representativeness ( $\chi^2 = 12.296$ ,  $df = 1$ ,  $p < .01$ ). The study respondents (males = 6; females = 19) and study non-respondents (males = 29; females = 40) do not have a similar proportion of male and female cases. A greater proportion of study non-respondents are males than study respondents. Therefore, in terms of gender, the study respondents ( $n = 25$ ) are not representative of the university non-respondents ( $n = 94$ ).

*Race.* A chi-square analysis revealed no statistically significant difference between the number of white students and the number of non-white students (Hispanics, African-Americans, Asians, and others recoded as “All Others”) in the two groups employed to test representativeness ( $\chi^2 = .431$ ,  $df = 1$ ,  $p = .511$ ). The study respondents (white students = 23; all others = 2) and study non-respondents (white students = 62; all others = 7) have a similar proportion of white students and all others cases. Therefore, in terms of race, the study respondents ( $n = 25$ ) are representative of the university non-respondents ( $n = 94$ ).

*First-year place of residence.* A chi-square analysis revealed a statistically significant difference between the number of students living in dormitories and the number of students living off-campus in the two groups employed to test representativeness ( $\chi^2 = 30.300$ ,  $df = 1$ ,  $p < .01$ ). The study respondents (dormitory = 10; off-campus = 15) and study non-respondents (dormitories = 50; off-campus = 19) do not have a similar proportion of dormitory and off-campus cases. A far greater proportion of

study non-respondents live in dormitories than do study respondents. Therefore, in terms of place of residence, the study respondents ( $n = 25$ ) are not representative of the university non-respondents ( $n = 94$ ).

*Major of study.* The number and frequencies for the discrete demographic variable of the students' major of study in spring semester of 2004 was reported from institutional records and grouped into colleges following NSSE's aggregate categories (See Tables 4).

Table 4  
Frequencies of Major by NSSE College Groups  
for Study Respondents and Non-Respondents

Major (NSSE College Groups)	N	%
Arts & Humanities		
Study Respondents	7	28.0
Study Non-Respondents	14	20.3
Biological Sciences		
Study Respondents	1	4.0
Study Non-Respondents	0	0.0
Business		
Study Respondents	5	20.0
Study Non-Respondents	6	8.7
Education		
Study Respondents	5	20.0
Study Non-Respondents	21	30.4
Physical Science		
Study Respondents	0	0.0
Study Non-Respondents	1	1.5
Professional		
Study Respondents	4	16.0
Study Non-Respondents	8	11.6
Social Science		
Study Respondents	2	8.0
Study Non-Respondents	2	2.9
Other		
Study Respondents	1	4.0
Study Non-Respondents	5	7.2
Undecided		
Study Respondents	0	0.0
Study Non-Respondents	12	17.4
Total		
Study Respondents	25	
Study Non-Respondents	69	

A comparison of both number and frequency in Table 4 show that the greatest number of study respondent students ( $n = 7$ ; 28%) were in the Arts and Humanities college group, while the greatest number of study non-respondent students ( $n = 21$ ; 30.4%) were in the Education college group. The next two college groups with the highest number of study respondent students were Business and Education, both with 5

students (20% each), while the colleges with the second and third highest number of study non-respondents were Arts & Humanities (n = 14; 20.3%) and the Undecided (n = 12; 17.4%) college groups.

In regards to major of study, the study respondents (n = 25) were generally representative of the university non-respondents (n = 94). Both study respondents and study non-respondents had larger percentages of Art & Humanities and Education majors, while they each only had one student in the Biological or Physical Sciences. However, they differed in that more study respondents were Business majors, while more of the study non-respondents were in the Undecided category.

*Parents' education.* Comparison of the study respondents and study non-respondents could not be assessed on parents' education because this variable was only self-reported by the students on the NSSE survey and was not available from the university for non-respondents. Data on this variable for the study non-respondents were therefore not available. The variable of parents' education could only be compared between the university respondents and the study respondents (See research hypothesis one findings) and not for the test of study respondents' representativeness.

*First-year grade point average (QPA).* Descriptive data for the study respondents' QPA for the first-year are described in the above section on the study respondents, and repeated in Table 5 along with the mean and standard deviation for the study non-respondents. Descriptive data for the study non-respondents' QPA included the mean of 2.88, standard deviation of .57, a minimum of 1.21, and a maximum of 3.86. A histogram (Figure 2) assessed general conformity of the study non-respondents' QPA data to test

normality. Visual inspection of the curve did indicate a slight departure from normality, due to the outlier of a QPA of 1.21.

Table 5  
QPA Mean and Standard Deviation for Study Respondents and Non-Respondents

Group	N	Median	Min.	Max.	Mean	SD
Study Respondents	25	3.02	1.87	3.93	2.98	.50
Study Non-Respondents	69	2.93	1.21	3.86	2.88	.57

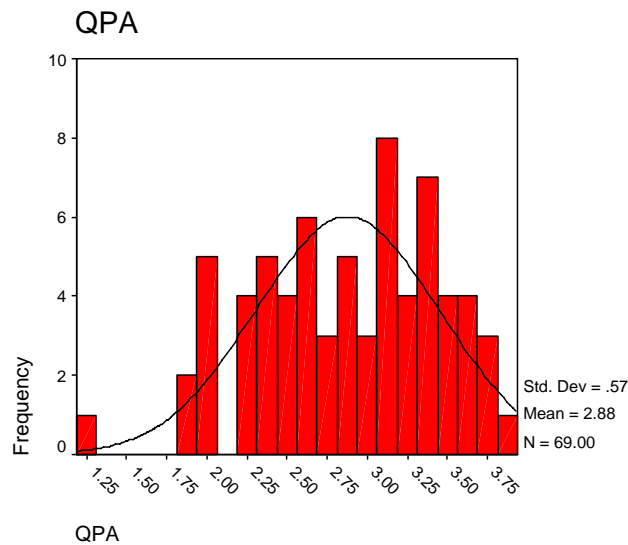


Figure 2: Histogram of Study Non-Respondents' QPAs

Comparison of the study respondents ( $n = 25$ ) and the study non-respondents ( $n = 69$ ), in Table 5, indicates a higher first-year QPA mean (2.98 vs. 2.88) and a lower standard deviation value (.50 vs. .57) for the study respondents. However, Table 6 reports the first-year QPA independent samples  $t$ -test comparison with no statistically significant difference ( $p > .05$ ). We conclude that the study respondents ( $n = 25$ ) were representative of the university non-respondents ( $n = 94$ ) on the first-year QPA variable.

Table 6  
QPA *t*-test Comparison for Study Respondents and Non-Respondents

Group	N	Mean	SD	<i>t</i> -Ratio	Sig
Study Respondents	25	2.98	.50		
Study Non-Respondents	69	2.88	.57	.78	N.S.

To summarize, the findings suggest that the study respondents are representative of the university non-respondents in terms of race, major of study, and QPA. However, they are not representative for the variables of gender and place of residence. The variable of parents' education could not be used for evaluating representativeness.

Having addressed the issue of study respondents' representativeness, we now proceed to the two research hypotheses to measure nonresponse bias. These will compare the two independent groups of NSSE 2004 first-year respondents [university respondents (UR):  $n = 103$ ] to the first-year non-respondents [study respondents (SR):  $n = 25$ ].

#### *Research Hypothesis One*

Research Hypothesis One states that there will be statistically significant differences found between the NSSE 2004 first-year respondents (UR:  $n = 103$ ) and the first-year non-respondents (SR:  $n = 25$ ) in seven socio-demographic variables: gender, race, first-year place of residence, first-year grade point average, major of study, and parents' educational level (father and mother).

Research hypothesis one was tested using independent sample *t*-tests for interval data and chi-square goodness-of-fit tests for nominal data. Frequencies and percentages compared students' major of study.

*Gender.* An independent chi-square analysis revealed no statistically significant difference between the number of females and males in the respondent and the non-respondent groups ( $\chi^2 = .738$ ,  $df = 1$ ,  $p = .390$ ). The non-respondents (SR: males = 6; females = 19) and the respondents (UR: males = 18; females = 85) have a similar proportion of male and female cases. Therefore, there is no significant difference in gender.

*Race.* A chi-square analysis revealed no statistically significant difference between the number of white students and the number of non-white students (Hispanics, African-Americans, Asians, and others recoded as “All Others”) ( $\chi^2 = .569$ ,  $df = 1$ ,  $p = .324$ ). The non-respondents (SR: white students = 23; all others = 2) and the respondents (UR: white students = 91; all others = 12) have a similar proportion of white students and all others cases. Therefore, there is no significant difference in race.

*First-year place of residence.* A chi-square analysis revealed no statistically significant difference between the number of students living in dormitories and the number of students living off-campus ( $\chi^2 = .0410$ ,  $df = 1$ ,  $p = .839$ ). The non-respondents (SR: dormitory = 10; off-campus = 15) and respondents (UR: dormitories = 42; off-campus = 58) have a similar proportion of dormitory and off-campus cases. Therefore, there is no significant difference in first-year place of residence.

*Major of study.* The data for the socio-demographic variable of major of study were obtained from the institution’s research office and grouped into NSSE’s aggregate college categories. A frequency analysis was run of students’ majors grouped by NSSE college groups in aggregate data to compare the major of study between the respondents (UR:  $n = 103$ ) and the non-respondents (SR:  $n = 25$ ). Number and frequency for both respondent groups is reported in Table 7.

Table 7  
Frequencies of Major by NSSE College Group  
for University Respondents and Study Respondents

Major (NSSE College Groups)	N	%
Arts & Humanities		
University Respondents	16	16.2
Study Respondents	7	28.0
Biological Sciences		
University Respondents	5	5.1
Study Respondents	1	4.0
Business		
University Respondents	7	7.1
Study Respondents	5	20.0
Education		
University Respondents	22	22.2
Study Respondents	5	20.0
Physical Science		
University Respondents	2	2.0
Study Respondents	0	0.0
Professional		
University Respondents	24	24.2
Study Respondents	4	16.0
Social Science		
University Respondents	12	12.1
Study Respondents	2	8.0
Other		
University Respondents	8	8.1
Study Respondents	1	4.0
Undecided		
University Respondents	3	3.0
Study Respondents	0	0.0
Total		
University Respondents	99*	
Study Respondents	25	

*Note.* \* Missing four cases of 103 total cases.

A comparison of the frequencies between university respondents and the study respondents reveals that the two respondent groups are similar in the major of study variable. Most of the university respondents and the study respondents were reported to be in the same six majors. Those are Professional, Education, Arts and Humanities, Social Sciences, Business and Other. The two groups differed in that the university

respondents had majors reported in the Undecided and sciences, while the study respondents had no undecided students and only one science major. Therefore, both the university respondents and the study respondents reported to be matriculated in similar NSSE college groups with similar major programs of study.

*Parents' education.* A chi-square analysis revealed no statistically significant difference between the number of students whose father's level of education is Secondary (recoded to combine Did not finish high school and Graduated from high school), Post-secondary (recoded to combine Attended college but did not complete degree, Completed an associate's degree and Completed a bachelor's degree), and Graduate (recoded to combine Completed Master's degree and Completed a doctoral degree) ( $\chi^2 = .865$ ,  $df = 2$ ,  $p = .649$ ). The non-respondents (SR: Secondary = 11; Post-secondary = 9; Graduate = 4) and respondents (UR: Secondary = 43; Post-secondary = 43; Graduate = 11) have a roughly similar proportion of Secondary, Post-secondary and Graduate cases. Therefore, there is no significant difference in father's education.

Analysis of the variable "mother's education" revealed a chi-square with no statistically significant difference between the number of students whose mother's level of education is Secondary (recoded to combine Did not finish high school and Graduated from high school), Post-secondary (recoded to combine Attended college but did not complete degree, Completed an associate's degree and Completed a bachelor's degree), and Graduate (recoded to combine Completed Master's degree and Completed a doctoral degree) ( $\chi^2 = 1.436$ ,  $df = 2$ ,  $p = .488$ ). The non-respondents (SR: Secondary = 12; Post-secondary = 11; Graduate = 2) and respondents (UR: Secondary = 43; Post-secondary =

52; Graduate = 4) have relatively similar proportions of Secondary, Post-secondary and Graduate cases. Therefore, there is no significant difference in mother's education.

*First-year grade point average (QPA).* To provide complete data on all groups in the study, Table 8 reports the mean and standard deviation for first-year grade point average (QPA), the study's one continuous demographic variable gathered from institutional records. Each student group is reported: the university respondents (n = 103), all the university non-respondents (n = 94), and separately, the study respondents (n = 25) and the study non-respondents (n = 69). A total is also given for the total (n = 197) of first-year students reported by the surveyed institution to be either university respondents or university non-respondents of their NSSE 2004.

Table 8  
QPA Mean and Standard Deviation for University and Study  
Respondents and Non-Respondents

Group	N	Median	Min.	Max.	Mean	SD
University Respondents	103	3.29	1.05	4.0	3.16	.56
University Non-Respondents	94	2.98	1.21	3.93	2.90	.57
Study Respondents	25	3.02	1.87	3.93	2.98	.50
Study Non-respondents	69	2.93	1.21	3.86	2.88	.57
Total	197	3.14	1.05	4.0	3.04	.57

QPA means are greater for those responding to the survey and less for those who did not. This is true for the university respondents and non-respondents and the study respondents and non-respondents.

A histogram (Figure 3) assessed general conformity of the university respondents' (n = 103) QPA data for normality. Visual inspection of the curve did indicate a slight departure from normality, due to an outlier of the minimum QPA of 1.05.

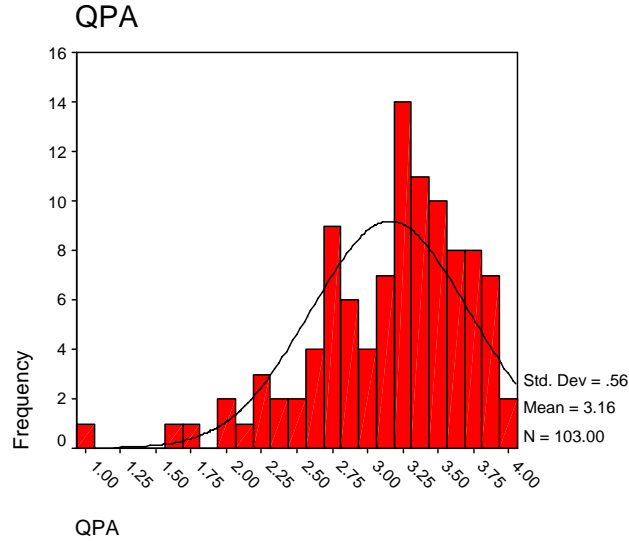


Figure 3: Histogram of University Respondents' QPAs

Table 9 reports the *t*-test for first-year QPA, suggesting that there is no statistically significant difference ( $t = -1.8, df=24, p = .08$ ) between the study respondents ( $n = 25$ ) and the university respondents ( $n = 103$ ). However the *p* value is approaching significance ( $p = .08$ ). Supporting the trend toward significance, Table 10 does report a statistically significant difference ( $p = 0.00$ ) between the university non-respondents ( $n = 94$ ) and the university respondents ( $n = 103$ ). In sum, there is no significant difference between respondents (UR) and non-respondents (SR) on QPA (based on study respondents), though there is a trend in the expected direction.

Table 9  
QPA *t*-Test Comparisons of University Respondents with Study Respondents

Group	N	Mean	SD	<i>t</i> -Ratio	Sig
University Respondents	103	3.16	.59		
Study Respondents	25	2.98	.50	-1.8	N.S.

Note. \* $p < .001$

Table 10  
QPA *t*-Test Comparisons of University Respondents with University Non-respondents

Group	N	Mean	SD	<i>t</i> -Ratio	Sig
University Respondents	103	3.16	.59		
University Non-Respondents	94	2.90	.55	-4.5	.000*

*Note.* \* $p < .001$

*Summary for research hypothesis one.* The data suggest that there is no statistically significant difference between the NSSE 2004 first-year respondents (university respondents;  $n = 103$ ) and the non-respondents (study respondents;  $n = 25$ ) in seven socio-demographic variables: gender, race, first-year place of residence, first-year grade point average (QPA), major of study, mother's educational level and father's educational level. Nevertheless, differences between mean group QPAs were close to significance ( $p = .08$ ), with respondents having higher mean QPAs than non-respondents. In addition, males and resident students were under-represented in the study respondent group.

#### *Research Hypothesis Two*

Research Hypothesis Two states that there will be a significant difference found between the NSSE 2004 first-year respondents [university respondents (UR):  $n = 103$ ] and the first-year non-respondents [study respondents (SR):  $n = 25$ ] in mean engagement scores on each of the five NSSE National Benchmarks of Effective Education Practice (engagement scales) (see Appendix M). There were five separate null hypotheses associated with Research Hypothesis Two, testing the five NSSE engagement scales: Level of Academic Challenge, Active and Collaborative Learning, Student-Faculty Interaction, Enriching Educational Experience, and Supportive Campus Environment.

The data analysis for Research Hypothesis Two utilized *t*-tests to examine group differences, comparing the study respondents to the university respondents on each of the five NSSE 2004 engagement scales. In order to explore differences in more detail, *t*-tests also compared means on the individual survey questions that are associated with each of the five engagement scales.

The assumptions required for tests of mean differences were examined prior to analyzing the *t*-tests as discussed previously. Unequal group size between the respondents (UR:  $n = 103$ ) and non-respondents (SR:  $n = 25$ ) was a concern for the researcher. First, the assumption of equal variances was tested using Levene's Test for Equality of Variances. The *F* test rejection level was set at  $\alpha = .05$  to assess differences among university respondents and study respondents groups. The Levene's Test statistically demonstrated that the two groups had approximately equal variances. Since a *t*-test is robust with respect to violations of the assumption of normal curve distribution when variances are equal, the test of homogeneity of variance was assumed to be sufficient.

In addition, as a cross-check due to large differences in sample sizes, both one-sample and independent sample *t*-tests were run to draw conclusions on mean statistically significant differences in order to double check results that showed significance. The one-sample *t*-test tested the survey results of the study respondent group against the mean of the university respondent group. In this case, the population parameter was the university respondent group mean. Overall, both types of *t*-tests found similar significant difference results for means on the engagement scales. Due to this similarity, the independent sample *t*-test data results were chosen to report significant outcomes. These results are reported in Table 11 with  $p < .05$  value.

Table 11

NSSE Scales *t*-test and Mean of University Respondents and Study Respondents

Scales	Group	Mean	<i>SD</i>	<i>t</i> -Ratio	Sig
Level of Academic Challenge	UR <sup>a</sup>	2.85	.464	-.327	N.S.
	SR <sup>b</sup>	2.88	.536		
Active and Collaborative Learning	UR	2.25	.395	-1.294	N.S.
	SR	2.36	.322		
Student-Faculty Interaction	UR	2.13	.496	-2.978	.003*
	SR	2.45	.427		
Enriching Educational Experience	UR	2.45	.405	1.578	N.S.
	SR	2.31	.340		
Supportive Campus Environment	UR	4.11	.680	1.262	N.S.
	SR	3.92	.757		

*Note.* <sup>a</sup>n = 103. <sup>b</sup>n = 25. UR = University Respondents. SR = Study Respondents. *SD* = Standard Deviation. \**p* < .01.

Table 11 reports that only the Student-Faculty Interaction Scale *t*-test showed a statistically significant difference. The mean for the university respondents was 2.13 (standard deviation = .496) and the mean for the study respondents was 2.45 (standard deviation = .427). As listed in Appendix M, the six individual survey items that make up this scale contained responses of 1 = Never or Have not decided, 2 = Sometimes or Do not plan to do, 3 = Often or Plan to do, and 4 = Very often or Done. Therefore, the study respondent group reported having more student-faculty interaction than did the university respondent group. Differences between the groups for the individual items for this significant NSSE engagement scale will be reported in the next section and discussed in Chapter Five.

*Summary for research hypothesis two.* To summarize the findings for Research Hypothesis Two, there is no significant difference between the NSSE 2004 first-year respondents (UR: n = 103) and the non-respondents (SR: n = 25) for four of the five NSSE engagement scales: Level of Academic Challenge, Active and Collaborative Learning, Enriching Educational Experience, and Supportive Campus Environment. However, there is a statistically significant difference between the NSSE 2004 first-year respondents (UR: n = 103) and the non-respondents (SR: n = 25) in mean engagement scores on the Student-Faculty Interaction Scale. Therefore, the hypothesis that there would be differences was supported on one of five NSSE National Benchmarks of Effective Education Practice.

*Analyses of NSSE Engagement Scales' Individual Survey Items*

Each NSSE engagement scale consists of six to eleven survey questions with a total of 40 items among the five scales (see Appendix M). This section reports the additional means and *t*-test analyses of the individual survey items associated with each engagement scale. An itemized comparison between the university respondents group and the study respondents group allowed for more detailed analysis of the survey results in order to measure nonresponse bias.

In nearly all comparison cases of items with statistically significant differences (See Table 12), the Levene's Test for Equality of Variances statistically demonstrated that the two groups had approximately equal variances. Since a *t*-test is robust with respect to violations of the assumption of normal curve distribution when variances are equal, the test of homogeneity of variance was assumed to be sufficient.

The one exception was an item associated with the scale Supportive Campus Environment: “Institutional Emphasis: Providing support to thrive socially.” The Levene’s Test demonstrated that equal variances were not assumed and the comparison was statistically significant at the .05 alpha level.

Continuing to test Research Hypothesis Two, both independent sample and one-sample *t*-tests were also assessed on each of the survey items which are associated with the five NSSE engagement scales. As in the previous mean comparisons, one-sample *t*-tests were run, in addition to the independent samples type, as a cross-check for the significance results, due to large differences in sample sizes. The one-sample *t*-test tested the survey results of the study respondent group against the mean survey results of the university respondent group mean. In this case, the population parameter was the university respondent group. Table 12 reports the individual survey items, by NSSE engagement scale, with statistically significant differences, beginning at the  $p < .05$  alpha level, and their values from the independent samples *t*-tests. Only one scale, Academic Challenge (see Appendix M), had no survey items with significant difference.

Table 12

Scale Items *t*-test and Mean of University Respondents and Study Respondents

Scale Survey Items	Group	Mean	<i>SD</i>	<i>t</i> -Ratio
<b>Active and Collaborative Learning</b>				
Worked with classmates outside of class	UR <sup>a</sup>	2.11	.791	
	SR <sup>b</sup>	2.44	.768	-1.90 <sup>+</sup>
Tutored or taught other students	UR	1.54	.764	
	SR	1.92	.909	-2.126*
<b>Student-Faculty Interaction</b>				
Received prompt feedback from faculty on academics	UR	2.51	.684	
	SR	3.04	.790	-3.341***
Work on a research project with a faculty member outside class	UR	1.93		
	SR	3.04	.978	-5.146***
<b>Enriching Educational Experience</b>				
Practicum, internship, co-op experience, etc.	UR	3.02	.727	
	SR	1.76	.831	7.551***
Community service or volunteer work	UR	3.28	.986	
	SR	1.88	1.013	6.318***
Foreign language coursework	UR	2.90	.928	
	SR	1.88	.900	4.904***
Study abroad	UR	1.89	.803	
	SR	2.92	.812	-5.721***
Culminating senior Experience	UR	1.90	.934	
	SR	2.75	.897	-4.029***
<b>Supportive Campus Environment</b>				
Institutional emphasis: Providing support to thrive socially	UR	2.32	.851	
	SR	1.96	.690 <sup>+</sup>	2.197*

Note. <sup>a</sup>n = 103. <sup>b</sup>n = 25. UR = University Respondents. SR = Study Respondents. *SD* = Standard

Deviation. <sup>+</sup>Equal variances not assumed.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p \leq .001$ . + $p$  is approaching significance (however, with one-sample *t*-test  $p < .05$ ).

Nine items reported statistically significant *t*-values ( $p < .05$ ) on both types of *t*-tests (See Table 11). One item (Worked with classmates outside of class) indicated a *p* value approaching significance with the independent *t*-test ( $p = .06$ ), while the one-

sample  $t$ -test reported a significant  $p$  value of .042 in this instance. The direction of the mean differences for these significant items is for the most part suggesting that the study respondent group is more engaged than the university respondent group. (1 = Never, Very little, Have not decided; 2 = Sometimes, Some, Do not plan; 3 = Often, Quite a bit, Plan to do; 4 = Very often, Very much, Done) However, several items suggest that the study respondent group is less engaged than the university respondent group: “Practicum, internship, co-op experience,” “Community service or volunteer work,” “Foreign language coursework,” “Providing support to thrive socially.” The interpretation of these findings will be discussed in the Chapter Five

Before proceeding to the additional analyses, the following is a brief summary of the primary nonresponse bias study analysis. The hypothesis that there would be differences on seven socio-demographic variables between respondents and non-respondents was not supported. The hypothesis that there would be differences between respondents and non-respondents was supported on only one of NSSE’s five National Benchmarks of Effective Education Practice: Student-Faculty Interaction, where non-respondents (SR) measured higher levels of engagement. A more detailed examination of the individual survey items that are associated with each benchmark reported nonresponse bias on nine items with five measuring the non-respondents (SR) with higher levels of engagement and four with lower levels.

#### *Analyses of Non-Scale Individual Survey Items*

The NSSE survey consists of 41 questions in addition to those associated with the five engagement scales analyzed through Research Hypothesis Two. Additional comparison information between the NSSE 2004 respondents and non-respondents was

readily available by coding the non-scale survey items and computing independent samples *t*-tests. Comparisons of these additional questions on student engagement provided further detailed understanding of nonresponse bias in NSSE 2004. Table 14 reports the 25 non-scale NSSE 2004 items with significant differences between the university respondents and the study respondents beginning from the  $p < .05$  alpha level.

Table 13  
Non-Scale Items *t*-test and Mean of University Respondents and Study Respondents

Non-Scale Survey Items	Group	Mean	<i>SD</i>	<i>t</i> -Ratio
Attended art exhibit or theatre performance	UR	2.35	.957	
	SR	2.96	1.060	2.801**
Participated in activities to enhance spirituality	UR	1.83	.845	
	SR	3.36	.810	8.157***
Participate in learning community or similar program	UR	1.94	1.037	
	SR	2.80	1.118	3.656***
Independent study or self- designed major	UR	1.84	.814	
	SR	2.79	.932	4.995***
Voting in local, state or national elections	UR	1.91	.922	
	SR	2.48	1.085	2.666**
Come to class w/out completing assignments	UR	1.68	.660	
	SR	3.12	.526 <sup>+</sup>	11.647***
Worked on a paper/project that required integrating from various sources	UR <sup>a</sup>	3.03	.678	
	SR <sup>b</sup>	1.96	.735	-6.956***
Memorizing facts/idea, etc so you can repeat them	UR	2.91	.864	
	SR	1.84	.624 <sup>+</sup>	-7.095***
Writing clearly and effectively	UR	2.89	.827	
	SR	2.04	.790	-4.634***
Speaking clearly and effectively	UR	2.72	.792	
	SR	2.17	.816	-3.054**
Thinking critically and analytically	UR	3.13	.747	
	SR	1.92	.812	-7.115***
Analyzing quantitative problems	UR	2.63	.837	
	SR	2.20	.707	-2.365*
Learning effectively on own	UR	2.90	.732	
	SR	1.88	.781	-6.151***
Used email to communicate with instructor	UR	2.85	.879	
	SR	2.04	.790	-4.234***
Using computers in academic work	UR	3.10	.689	
	SR	1.56	.712	-9.931***
Using computing and information technology	UR	2.83	.842	
	SR	2.00	.816	-4.436***
Working effectively with others	UR	2.89	.852	
	SR	2.12	.927	-3.972***
Understanding yourself	UR	2.79	.902	
	SR	2.32	.852	-2.354*
Developing a personal code of values and ethics	UR	2.81	.884	
	SR	2.24	1.012	-2.800**
Attending campus events and activities	UR	2.97	.822	
	DR	2.56	.870	-2.205*
Acquiring job or work-related knowledge/skills	UR	2.78	.871	
	SR	2.28	.792	-2.611**

Non-Scale Survey Items	Group	Mean	SD	t-Ratio
Overall, how evaluate quality of academic advising?	UR	3.10	.644	-9.081***
	SR	1.76	.723	
Acquiring a broad general education	UR	3.25	.672	-9.174***
	SR	1.84	.746	
How evaluate entire educational experience?	UR	3.14	.667	-8.244***
	SR	1.92	.640	
If start over again, would go to same institution?	UR	3.14	.779	-4.562***
	SR	2.32	.900	

Note. <sup>a</sup>n = 103. <sup>b</sup>n = 25. UR = University Respondents. SR = Study Respondents. SD = Standard

Deviation. <sup>+</sup> Equal variances not assumed.

\* $p < .05$ . \*\* $p \leq .01$ . \*\*\*  $p < .001$ .

Equal variances were assumed for each non-scale item with significant differences reported in Table 13. In the same manner as with the survey items associated with the engagement scales, in most comparison cases of items with statistically significant differences, the Levene's Test for Equality of Variances statistically demonstrated that the two groups had approximately equal variances. Since a  $t$ -test is robust with respect to violations of the assumption of normal curve distribution when variances are equal, the test of homogeneity of variance was assumed to be sufficient.

The two exceptions were "Come to class without completing assignments" and "Memorizing facts and ideas, etc so you can repeat them." The Levene's Test demonstrated that equal variances were not assumed and the comparison was statistically significant at the .001 alpha level.

A general grouping of these survey items suggests that they appear to be in areas such as computer use, interpersonal communication skills, study skills, academic behaviors, and extracurricular activities. These items include personal growth and development areas where students are individually motivated and responsible for their own actions.

The direction of the mean difference, for the two groups reported in Table 13, is reflective of the study respondent group being less engaged than the university respondent group (1 = Never, Very little, Poor; 2 = Sometimes, Some, Fair; 3 = Often, Quite a bit, Good; 4 = Very often, Very much, Excellent) on the majority of the 25 significant items. However, the direction of the mean difference for five items suggests that the study respondent group was more engaged. They are: “Attended art exhibit or theatre performance,” “Participated in activities to enhance spirituality,” “Participate in learning community or similar program,” “Independent study or self- designed major,” “Voting in local, state, or national elections.” The interpretation of these findings will be discussed in Chapter Five.

Overall, these 25 items, with statistically significant differences between the university respondents and the study respondents, represent more than half the amount of non-scale items. This percentage (61%) is much greater than the percentage of engagement scale-associated survey items with statistically significant differences between the university respondents and the study respondents (25%). Their comparatively greater significance to nonresponse bias and engagement will be discussed in the next and final chapter.

### *Summary of Results*

This study was the first locally administered nonresponse bias study of the NSSE. It was conducted on undergraduate students at an independent comprehensive Catholic university in northeastern Pennsylvania. Its focus was to compare the 2004 first-year respondents to the first-year non-respondents. Two research hypotheses guided the nonresponse bias study. The first hypothesis tested differences in seven socio-

demographic variables, stating that there would be differences between the two groups. The second hypothesis compared survey results on engagement scales, stating that there would be differences between the two groups.

Research hypothesis one was rejected due to statistically nonsignificant results. However, three variables are worth noting. The variable QPA did show a trend toward significant difference (see Table 9). Also, when testing the study respondents ( $n = 25$ ) to see if they represented all university non-respondents ( $n = 94$ ), gender and place of residence indicated that males and students living on campus were under-represented.

Also, research hypothesis two was rejected (See Table 11) for all engagement scales except for Student and Faculty Interaction which reported a significant difference between first-year respondents and non-respondents ( $p < .05$ ). Analyses of the individual survey items associated with each engagement scale reported that 10 of the 40 items showed significant difference (see Table 12).

Nevertheless, additional analyses did show statistically significant findings in 25 of the additional 41 survey items not associated with the engagement scales (see Table 13). The next and final chapter of this research study offers a discussion and implications of these findings and proposes, among other recommendations for future research, additions to the methodological approach utilized for future studies of nonresponse bias on student surveys.

## CHAPTER FIVE

### Discussion and Conclusions

#### *Review of Study*

The purpose of this study was to measure nonresponse bias of first-year undergraduate students in the National Survey of Student Engagement (NSSE) 2004, (Indiana University Bloomington, 2003) at an independent comprehensive Catholic university in northeastern Pennsylvania. The NSSE is a post-secondary outcomes-based assessment tool developed to measure student engagement based on process and performance indicators of learning and development through the student self-report process. It is theoretically derived from Chickering and Gamson's (1987) "Principles of Good Practice" and Ewell and Jones' (1996) *Indicators of Good Practice*.

A measurement study, with a local over-sample design, this study compared first-year respondents to first-year non-respondents in order to answer the following research question:

What is the evidence that nonresponse bias exists for first-year undergraduate students in the results of the NSSE 2004 data collection, at an independent comprehensive Catholic university in northeastern Pennsylvania?

The two research hypotheses are:

Research Hypothesis One: There will be significant differences found between the NSSE 2004 first-year non-respondents and the first-year respondents in socio-demographic variables, such as gender, race, first-year place of residence, first-year grade point average (QPA), major of study, and parents' educational level.

Research Hypothesis Two: There will be a significant difference found between the NSSE 2004 first-year non-respondents and first-year respondents in mean engagement scores on each of the five NSSE National Benchmarks of Effective Education Practice.

This final chapter provides an examination of the findings in relation to existing research on student engagement and student surveys, within the framework of the theoretical perspective from which this research was conducted. The general findings discussion include: the limitations of this study, implications and applications of the findings, and recommendations for future nonresponse bias studies of the NSSE, in particular, and of student surveys in general.

*Importance of Student Engagement, Its Assessment and Nonresponse Bias  
Theoretical Perspective*

As discussed in Chapters One and Two, the theoretical perspective of this study was a synthesis of social foundations inquiry (Cameron, 2003), student engagement (Shulman, 2002) and scholarship of assessment (Banta and Associates, 2002).

To briefly summarize, this study, which utilized the NSSE as the tool to measure engagement, is seen through the lens of the tradition of social foundations inquiry (Cameron, 2003). When applied to the fields of undergraduate learning and assessment, social foundations inquiry includes a philosophical purpose of education where engagement is both process and product (Shulman, 2002). In other words, learning is a continual process where today's educational context serves as the foundation for tomorrow's lessons and growth. Engagement (both in school and in society) is both the

means and the end of life-long education that develops social individuals who each are responsible for their role in world history.

Engagement as process is currently being assessed at undergraduate institutions by the NSSE. This research study contributed to the current evolving scholarship of post-secondary assessment (Banta and Associates, 2002) by conducting a relatively infrequent nonresponse bias study. Such a scholastic practice is necessary not only because this student survey has had a low response rate, but also to insure the generalizability of the results to the population assessed. In other words, NSSE survey results with small samples could be utilized to assess institutions of higher education for areas of quality improvement in student engagement across our nation. We need to know if the survey results do indeed represent the group of students assessed.

#### *Nonresponse Bias*

As discussed in the literature review of Chapter Two, nonresponse bias has been identified as one of six possible types of survey error which may negatively affect study results and conclusions (Dillman, 2000; Groves, Fowler, Couper, Lepkowski, Singer & Tourangeau, 2004; Linder, Murphy & Briers, 2001).

In scholarship terms, the presence of nonresponse bias is a threat to the external validity or generalizability of research findings to the target population of a study (Linder, Murphy, & Briers, 2001). Unfortunately, less time and attention have been devoted to reducing nonresponse error, whose reference is rarely mentioned in published survey findings (Hawkins, 1975; Linder, Murphy & Briers, 2001). It is the aim of the researcher to demonstrate the value of the nonresponse bias study and to offer a viable

example for NSSE participating institutions which can also be replicated for other student surveys.

This nonresponse bias study adopted the least common, yet most thorough, approach to study nonresponse bias: “over-sampling” (Hayek, 2004, personal communication, June approx 2, 2004). This method focuses exclusively on the actual non-respondents themselves, utilizing a follow-up comparison measurement study with the university respondents after the main survey is completed. Comparisons are then conducted on items and variables relevant to the research topic, in addition to socio-demographic variables (Bradburn, 1992; Carifio, 1987; Ellis, Endo & Armer, 1970; Gall et al., 1996; Hutchison, Tollefson & Wigington, 1987; Kuh, 2001a; Lindner, Murphy & Briers, 2001; Nielson, Moos & Lee, 1978; Pace, 1939; Rogelberg & Luong, 1998; Tuckman, 1999). Following the advice of researchers who describe the over-sample design, the study survey was administered by mail, with all of the NSSE 2004 survey items included. Regardless of the fact that a few researchers have been critical of a nonresponse bias study with a small sample size (Goyder, 1986; Groves & Couper, 1998), the 25 study respondents were a sufficient number based on the recommended sample size by many researchers (Gall et al., 1996; Lindner, Murphy & Briers, 2001; Rogelberg & Luong, 1998; Tuckman, 1999) as well as those consulted specifically for this study (John Tarnai, personal email September 8, 2004; Mick Couper, personal email September 17, 2004).

The most robust findings of this research study presented in Chapter Four are examined below in relation to the related literature reviewed in Chapter Two. The findings and conclusions discussion explores the nonresponse bias study’s results

associated with the two study hypotheses, as well as those concerning the analyses conducted on the additional NSSE individual survey items.

### *Discussion and Conclusions*

Thoroughly discussed in Chapter Two, the reason for conducting a nonresponse bias study is to test representativeness of the respondents to the surveyed population to ensure generalizability of survey results to the population. Initially, the study respondents were tested for representativeness of the university non-respondents. Secondly, the two research hypotheses measured the differences between the respondents and non-respondents in order to test for evidence of nonresponse bias. Lastly, the additional analyses compared respondents and non-respondents on engagement scale and non-scale individual survey items. The following discussion is patterned on this sequence offering conclusions as to whether or not the NSSE 2004 university respondents and their survey responses do represent all first-year students at the surveyed university. Implications of the findings will be outlined in a separate section.

#### *Study Respondent Representativeness*

The findings were mixed for whether the study respondents ( $n = 25$ ) were representative of the university non-respondents ( $n = 94$ ). The study respondents were representative of the university non-respondents in terms of race, major of study, and first-year QPA, but not for the socio-demographic variables of gender and first-year place of residence.

Proportionately, more males and more students who lived on campus in dormitories did not respond to the study survey. The finding that males respond less to surveys is strongly reflected in the literature review (Bradburn, 1992; Curtin et al., 2000;

Dey 1997; Hutchinson, Tollefson & Wigington, 1987; National Center for Education Statistics, 2002; National Survey of Student Engagement, 2003b; Porter & Whitcomb, 2004b; Sax, Gilmartin, & Bryant, 2003; Singer et al., 1999; Singer et al., 2000).

Unfortunately, the variable “place of residence” was not compared in these studies.

Nevertheless, this factor is important due to its role in students’ accessibility to campus life activities. It seems logical that students who reside off-campus would respond less to surveys since research reports commuters being less engaged with less interaction with faculty and other students and inhibited academic and social integration (Astin, 1977; Kuh, Schuh, Whitt & Associates, 1991; Pascarella & Terenzini, 1991; 2005). However, given the opposite finding for the study survey, it appears that not to be the case at the institution surveyed.

Lastly, even though in general it appeared that the study respondents did represent the non-respondents for “major of study,” more study non-respondents reported to be “undecided” on their major of study, while more study respondents were Business majors. Despite the fact that the literature review was sparse with analysis of these types of factors, such information lends insight into which student sub-populations to target with strategies to increase response rates at the university surveyed.

#### *Research Hypothesis One*

Research Hypothesis One states that there will be statistically significant differences found between the NSSE 2004 first-year respondents [university respondents (UR): n = 103] and the first-year non-respondents [study respondents (SR): n = 25] in seven socio-demographic variables: gender, race, first-year place of residence, first-year

grade point average (GPA), major of study, and parents' educational level (father and mother).

The data suggest that there is no significant difference between first-year respondents (UR) and first-year non-respondents (SR) on these seven socio-demographic variables. In other words, it can be concluded that, similar to the nonresponse bias tests conducted by Carifio (1987) and Hutchison, Tollefson and Wigington (1987), there was no significant difference between the respondents and the non-respondents. Therefore, it follows that there is no evidence of nonresponse bias for the socio-demographic factors measured by this study and it can be inferred that the respondents (UR) are reasonably representative of the surveyed population in terms of these socio-demographic variables.

However, this conclusion for Research Hypothesis One was in contrast to Green (1991), who reported in her nonresponse bias wave analysis on teachers, that there were significant differences on socio-demographic variables of age and gender between the groups of her study. In addition, she found differences in both attitude/behavior and data quality between respondents and non-respondents, where "delay of response seemed to be associated with less interest in the topic" (Green, 1991, p. 275).

Despite the general conclusion that the respondents and non-respondents were similar on socio-demographic variables, detailed findings lent insight into nonresponse behavior. For both groups, "undecided" and science students were under-represented for the variable "major of study." In addition, based on mother's and father's education level, a greater percentage of non-respondents (SR), than respondents (UR), were first-generation college students. Again, these are all sub-populations within the institution to target with strategies to increase response rates.

In terms of QPA, the finding that no statistically significant difference existed between the respondents (UR) and the non-respondents (SR), was similar to the one reported by Boser (1988) for GPA and achievement test scores. However, the difference between mean group QPAs were close to significance ( $p = .08$ ) and indicate a trend in that direction. Furthermore, when comparing all the university non-respondents ( $n = 94$ , not simply the study respondents of  $n = 25$ ) to the university respondents on QPA, there was a significant difference indicating that the respondents had higher QPAs and their responses could not be generalized to the non-respondents. This is reflective of other studies which found more student respondents had higher grades and higher self-reported academic ability (Dey 1997; Hutchinson et al., 1987; Kuh, 2001b; Porter & Whitcomb, 2004b).

In conclusion, solely based on the seven socio-demographic variables measured in this study and the comparison between the university respondents ( $n = 103$ ) and this study's respondents ( $n = 25$ ), the NSSE 2004 first-year respondents and first-year non-respondents are similar. Therefore, it can be inferred from the data that there is little evidence of nonresponse bias and thus the first-year respondents are generally representative of the surveyed first-year population in socio-demographic terms. In other words, the assumption that the NSSE 2004 first-year respondents' socio-demographic data represent the entire first-year population at the institution surveyed in this study is supported to some extent. However, if we include the representativeness test of comparison between the study respondents ( $n = 25$ ) and the study non-respondents ( $n = 69$ ), male students and students living on campus in dormitories were under-represented among the study respondents.

*Research Hypothesis Two*

Research Hypothesis Two states that there will be a significant difference found between the NSSE 2004 first-year respondents [university respondents (UR):  $n = 103$ ] and the first-year non-respondents [study respondents (SR):  $n = 25$ ] in mean engagement scores on each of the five NSSE National Benchmarks of Effective Education Practice (engagement scales) (see Appendix M).

To briefly summarize, four of the five NSSE engagement scales had no statistical significant differences between the mean engagement scale scores of the NSSE 2004 respondents and those of the non-respondents. Therefore, it can be inferred that there is no evidence that nonresponse bias exists for the following NSSE engagement scales: Level of Academic Challenge, Active and Collaborative Learning, Enriching Educational Experience, and Supportive Campus Environment. In other words, the assumption that the NSSE 2004 first-year respondents' data represent the entire first-year population at the institution surveyed in this study is supported for these four engagement scales.

In contrast, there was a statistically significant difference between the NSSE 2004 first-year respondents (UR:  $n = 103$ ) and the first-year non-respondents (SR:  $n = 25$ ) in mean engagement scores on the fifth scale: Student-Faculty Interaction (see Appendix M). Therefore, there is evidence that nonresponse bias exists for this engagement scale. Given the higher score ratings by the non-respondent group (SR) than by the respondent group (UR), it can be inferred that the non-respondents (SR) reported having more student-faculty interaction than did the respondents (UR).

As discussed thoroughly in the review of literature of Chapter Two, student interaction with faculty is a major indicator of student engagement (Astin, 1993;

Chickering & Gamson, 1987; Cross 1998; Kuh, 1995, 1999; 2001a; 2001c; Light, 2001; Pascarella & Terenzini, 1991; 2005; Tinto, 1993). Therefore, it follows that the non-respondents (SR) also appear to be more engaged than the respondents (UR) given the direction of the scale mean. Based on this evidence, nonresponse bias exists for this one engagement scale.

These results were similar to the nonresponse bias study results conducted on the NSSE 2001. Kuh (2001b) and Hayek (personal conversation, June, 2003) report that their non-respondents showed few measurable differences from the respondents, yet it appeared that the non-respondents “may actually be slightly more engaged than respondents” (Kuh, 2001b, p. 13). Additional NSSE local over-sample nonresponse bias studies need to be conducted in order to measure whether this finding can be replicated and generalized.

In sum, the engagement scale results for Research Hypothesis Two offered a macro-view of nonresponse bias and the issue of representativeness for the NSSE 2004 at the institution surveyed. From this view, the assumption that the NSSE 2004 first-year university respondents’ data represent the entire first-year student population is suspect. It follows then that the institution surveyed may have underestimated the level of engagement of the entire population of first-year students for the Student-Faculty Interaction Scale by simply looking at the university respondents’ results. Regardless of the results, these engagement scale-level findings and conclusions were only a first-step in assessing the nonresponse bias of the NSSE 2004 and whether or not the first-year university respondents’ levels of engagement represent all first-year students.

*Analyses of NSSE Engagement Scales' Individual Survey Items*

Only one of the five engagement scales, the Level of Academic Challenge (see Appendix M), had no evidence of nonresponse bias for any of its individual survey items. Therefore, it can be inferred that the assumption, that the NSSE 2004 first-year respondents' data represent the entire first-year student population surveyed, is supported for all the individual survey items associated with that scale.

There were only nine individual survey items that reported statistically significant differences among the four remaining engagement scales. These significant items will be discussed and conclusions drawn by engagement scale.

On the Active and Collaborative Learning Scale (see Appendix M), two of the seven individual survey items associated with the scale measured significant differences. These items answered “In your experience at your institution during the current school year, about how often have you done each of the following?” The mean comparison for the following items reported the non-respondents (SR) having the higher mean: “Worked with classmates outside of class to prepare class assignments” and “Tutored or taught other students.” The direction of the non-respondents' mean suggests that the non-respondents (SR) are more engaged in these areas than the respondents (UR). Therefore, it can be inferred that there is evidence of nonresponse bias on these items. In conclusion, the assumption, concerning these two items, that the NSSE 2004 first-year respondents' data represent the entire first-year population is suspect. It is possible that the institution surveyed may have underestimated the level of engagement of the entire population of first-year students for these two survey items by simply looking at the respondents' (UR) results.

The passing of time could have easily influenced the students' higher mean response for these two issues. Eight months later, not only do students have a better understanding of the importance of working and studying together, but they will have been offered more opportunities to do so.

As quantitatively measured for Research Hypothesis Two, the fifth engagement scale, Student-Faculty Interaction, was the only scale to statistically report a difference (as an engagement scale) between the first-year respondents and the first-year non-respondents. Oddly enough however, it only had two individual survey items with significant difference between the two groups, with the non-respondents measuring higher means than the respondents.

The first item "Received prompt feedback from faculty on your academic performance" suggests that the non-respondents (SR) were receiving more feedback than the respondents (UR) from their professors. Again, the time lapse of eight months and another semester of academic courses could have influenced the higher mean response for the non-respondents (SR). As discussed previously, engagement practitioners and researchers emphasize the importance of student-faculty interaction to increase student engagement. Academic feedback is a primary opportunity for this interaction.

The second significantly different Student-Faculty Interaction Scale item was "Work on a research project with a faculty member." The question for this item was "Have you done or do you plan to do before you graduate from your institution?" As with the other Student-Faculty Interaction item, the non-respondents (SR) are more engaged on this issue than the respondents (UR), since the non-respondents (SR) are already planning to work on a research project with a faculty member while the respondents (UR)

are either not sure or are not planning to do so. Therefore, it can be inferred that evidence of nonresponse bias does exist with this issue.

The institution could benefit from probing more into the situation even though it is a future-oriented or planned engagement activity. As with other items discussed above, this might not be as serious an engagement measure for a first-year student as it would be for a senior student who has reported a current engaged behavior.

Again, the time lapse issue could have played a part in such a difference in the item means. During the eight months, the first-year non-respondents (SR) might have been exposed to either information on a future opportunity or at least the importance of participating in such student-faculty activities.

In conclusion, it can be inferred that there is evidence of nonresponse bias on these two Student-Faculty Interaction Scale items. In other words, the assumption, concerning these items, that the NSSE 2004 first-year respondents' (UR) data represent the entire first-year population is suspect. It follows then that the institution surveyed may have underestimated the level of engagement of the entire population of first-year students for these two survey items by simply looking at the respondents' (UR) results.

Next, the engagement scale with the highest number of statistically significant items was Enriching Educational Experiences (see Appendix M). Its five significant items had mixed results concerning the direction of the mean for the non-respondents (SR). All of these items answered the question: "Which of the following have you done or do you plan to do before you graduate from your institution?"

Three of the items had non-respondents' (SR) with means lower than the respondents (UR), suggesting less engagement for the non-respondents (SR). The results

for “Practicum internship, field or co-op experience, clinical assignment” and “Community Service or volunteer work” suggest that most of the respondents (UR) are planning career exploration/preparation experiences, while the non-respondents (SR) either have still not decided or do not plan to do so. This is odd since more than half of the study respondents are in Education, Business and Professional majors of study where an internship or volunteer type job experience in their field would be very beneficial or might even be required, such as teaching.

The third item in this scale with a lower non-respondent mean was “Foreign language coursework.” Upon initial analysis, the lower level of engagement is unfortunate since many of the non-respondents (SR) were in majors of study where foreign language study would be helpful or welcomed since the population of the United States is growing with people who speak a foreign language. In addition, their response is extremely odd since all students are required to complete six credits of a foreign language in the Liberal Arts core curriculum at the university surveyed (University Catalog, 2006).

In addition, this result is rather contradictory with the next item in this scale “Study Abroad” whose mean comparison suggested more engagement for the non-respondents (SR). These data indicate that the non-respondents (SR) are planning to study abroad but not to study a foreign language. Clarification on the relationship between studying abroad and learning a foreign language appears to be needed for first-year students.

The results for the last item in the Enriching Educational Experiences Scale, “Culminating senior experience (comprehensive exam, capstone course, thesis, project,

etc),” also indicated that the non-respondents (SR) were more engaged. An explanation of this significant difference could be related to the time lapse limitation discussed above. With the passing of about eight months time, these former first-year students might have acquired information about the importance of a senior capstone course, as they are leaning toward planning to participate in such an activity or may have learned such an activity is required in their major. In addition, an explanation for the university respondents to be less engaged, with responses between “Have not decided” and “Do not plan,” could be that the first-year students were reflecting back to their senior year in high school and not thinking ahead to their last year in college.

The time lapse limitation could also help to explain the study abroad mean difference. Nevertheless, these last two items with data that infer that the non-respondents (SR) are more engaged, are not current behavior self-reports but report of a future planned engagement activity. For first-year students, this might not be as serious an engagement measure as it would be for a senior student who is reporting that they have or are doing such activities.

In conclusion, it can be inferred that there is evidence of nonresponse bias on the significant Enriching Educational Experiences engagement items. Therefore, the assumption, concerning these five items, that the NSSE 2004 first-year respondents’ (UR) data represent the entire first-year population is suspect. It follows then that the institution surveyed may have either over- or underestimated the level of engagement of the entire population of first-year students for these items by simply looking at the respondents’ (UR) results.

Lastly, the Supportive Campus Environment Scale had one survey item, out of six (see Appendix M), with a statistically significant difference: “Extent institution emphasizes – providing the support you need to thrive socially.” The comparison suggests that the first-year non-respondents (SR: even after eight months more experience on campus) feel that the institution does not provide enough support for them to thrive socially and so are less engaged in this area than are the first-year respondents (UR). Actually, the respondents (UR) themselves barely reported that the institution provides some support. This is an obvious area for institutional improvement.

In conclusion for this one Supportive Campus Environment individual item, it can be inferred that there is evidence of nonresponse bias. In other words, the assumption, in this case, that the NSSE 2004 first-year respondents’ (UR) data represent the entire first-year population is suspect. It follows then that the institution surveyed may have overestimated the level of engagement of the entire population of first-year students for this one survey item by simply looking at the respondents’ (UR) results.

The nine individual survey items that reported statistically significant differences, associated with the NSSE engagement scales, all indicated that the assumption that the NSSE 2004 first-year respondents’ (UR) data represent the entire first-year population is suspect. To strengthen the value of comparing individual survey items, when measuring nonresponse bias, the findings and conclusions from the study’s non-scale items’ analyses are presented below.

#### *Analyses of Non-Scale Individual Survey Items*

Originally, the researcher was not interested in measuring nonresponse bias on the survey items not included in the five engagement scales. However, when 25 of those 41

items reported significant differences between the first-year respondents (UR) and first-year non-respondents (SR), analysis of those results appeared to be a reasonable next step. A general grouping of these survey items suggests that they appear to be in areas of personal growth and development such as computer use, interpersonal communication skills, study skills, academic behaviors, and extracurricular activities.

The direction of the mean difference, for the two groups, is reflective of the non-respondent group (SR) being less engaged than the respondent group (UR) on the majority of the 25 significant items. However, the direction of the mean difference for five of the 25 items suggests that the non-respondent group (SR) was more engaged. They are: “Attended art exhibit or theatre performance,” “Participated in activities to enhance spirituality,” “Participate in learning community or similar program,” “Independent study or self- designed major,” “Voting in local, state, or national elections.”

Overall, these five items, where first-year non-respondents (SR) appear to be more engaged than the first-year respondents (UR), share similar contexts. These activities are ones that students could become aware of, not only for the first time at college, but also more as time passes. It can be said that for a first-year student, these activities (art exhibits, spiritual activities, learning community, independent study) might not be as important or a priority. However, as the students progress through their semesters, they learn more about them and are offered more frequent opportunities for participation in these types of activities. The activity that truly fits this analysis is “Voting” because the national election was in September 2004 and the significant difference between the two groups indicates more involvement several months after the

election. In sum, the limitation of time-lapse could have played a role in the higher mean and needs to be taken into account.

In conclusion, it can be inferred that there is evidence of nonresponse bias on these five non-scale items. In other words, the assumption, concerning these items, that the NSSE 2004 first-year respondents' (UR) data represent the entire first-year population is suspect. It follows then that the institution surveyed may have underestimated the level of engagement of the entire population of first-year students for these survey items by simply looking at the respondents' (UR) results.

Examining the 20 items that measured the non-respondents (SR) to be less engaged, most can be grouped together as academic behavior and study skills items. They concern such behaviors as whether or not students complete assignments, integrate information from various sources in a paper, are capable of memorization, writing, speaking and learning effectively, and have critical and analytical thinking.

The first one, "Come to class without completing readings or assignments," dealt specifically with the students' own actions and motivation. The findings suggested the respondents (UR) "never" or "sometimes" went to class unprepared, while the non-respondents (SR) "often" went to class unprepared. This finding seems in contrast to the fact that the engagement scale that deals specifically with academic behaviors, Level of Academic Challenge, not only did not have a significant difference between respondents (UR) and non-respondents (SR) as a scale, it did not have any individual survey items within the scale with significant difference. Specifically, according to the data from the Level of Academic Challenge scale, the non-respondents (SR) responded that they spent a similar *amount of time* [italics added] preparing for class as did the respondents (UR).

Nevertheless, the finding of this non-scale item comparison suggests that the non-respondents (SR) did not feel as though they had actually prepared themselves sufficiently for class, in comparison to the respondents (UR), during that similar period of time.

An additional key to understanding these differences in group means, for the remainder of the non-scale academic behavior and study skills items, lies with the factor that the questions posed dealt more or less with the experience that the institution contributed to the students' development in these areas. For these academically oriented items, the non-respondents' (SR) answers were usually "Never," "Very little" or "Poor" when, in comparison, the respondents' answers were usually "Often," "Quite a bit," or "Good." Therefore, the first-year non-respondents (SR) seemed less engaged than the first-year respondents (UR), inferring the existence of evidence of nonresponse bias on these items.

Reflecting on this finding, it seems odd again that the engagement scales of Level of Academic Challenge and Supportive Campus Environment measured no significant difference, while these non-scale items dealing with academic skills did show the non-respondents (SR) less engaged. This shows that a micro-view of engagement, by individual items within each scale, is valuable to pinpoint institutional areas for improvement.

In conclusion, both first-year respondents (UR) and first-year non-respondents (SR) did report that the institution offers activities and support to challenge students academically, but the non-respondents' (SR) less engaged responses, on the non-engagement scale items, suggests that some students think that the institution does not

offer opportunities to develop the skills needed to do well in such activities. Additional items on which the non-respondents (SR) had lower means and seemed less engaged, dealt with computer use: “Use email to communicate with an instructor,” “Using computers in academic work,” and “Using computing and information technology.” These are areas for investigation to increase engagement at the institution of this study.

“Working effectively with others,” “Understanding yourself,” “Developing a personal code of values and ethics,” “Acquiring job or work-related knowledge/skills,” and “Attending campus events and activities” were additional topics of these significant non-scale items, where the first-year non-respondents (SR) were less engaged than the first-year respondents (UR). This finding seems to be in conflict to the earlier finding of no significant difference between the first-year respondents (UR) and first-year non-respondents (SR) for the Enriching Educational Environment scale. Numerous items on this scale dealt with working with others and learning outside of the classroom, as do these items. In addition, this finding seems to be in conflict with the five initially discussed non-scale items, where the non-respondents (SR) were more engaged on items of a similar nature. Borrowing from other courses, programs and strategies for the first-year student (Upcraft, Gardner, & Associates, 1989; Upcraft, Gardner, Barefoot & Associates, 2005), increased student engagement in these areas issues could be addressed through intentional efforts by the university surveyed.

Four of the non-scale significant items consisted of satisfaction questions related to the institution’s efforts: evaluating the quality of academic advising, if the student had acquired a broad general education, evaluating the student’s entire educational experience at the institution, and whether or not they would go to the same institution if they could

start over again. In all these cases, the first-year non-respondents (SR) measured less engaged and it is inferred that there is evidence of nonresponse bias for these items. For all four, the first-year respondents (UR) rated academic advising “Good” to “Excellent” and that they would “Probably” to “Definitely” attend the same institution. However, the first-year non-respondents (SR) were more likely to report that they would “Probably not” attend again.

These findings, especially on the last two items, offer further detailed insight into perhaps the bottom-line issues where first-year respondents (UR) and first-year non-respondents (SR) differ. Their responses on these four satisfaction non-scale items suggest that the original conclusion for Research Hypothesis Two (based on the mean engagement scale significant results), that the first-year non-respondents (SR) are slightly more engaged, is over-estimated.

In conclusion concerning the above twenty discussed non-scale items that measured the non-respondents (SR) as less engaged, it can be inferred that there is evidence of nonresponse bias. In other words, the assumption, concerning these items, that the NSSE 2004 first-year respondents’ (UR) data represent the entire first-year population is suspect. It follows then that the institution surveyed may have overestimated the level of engagement of the entire population of first-year students for these non-scale survey items by simply looking at the respondents’ (UR) results.

As mentioned in Chapter Four, the 25 non-scale survey items, with statistically significant differences between the first-year respondents (UR) and the first-year non-respondents (SR), represent more than half the amount of non-scale items. This percentage (59%) is much greater than the percentage of engagement scale survey items

with statistically significant differences (25%). A macro-analysis based on solely the five engagement scales assists in general analysis and communication of findings. However, considering only the greater percentage of statistically significant results suggests that these non-scale items play an important role in measuring student engagement and need to be included in future NSSE nonresponse bias studies. Furthermore, the above item-based micro-analysis lends even more support to that conclusion. It becomes clearer where the institution can target its resources for increasing student engagement.

Before proceeding to the discussion of the implications and practical applications of these findings, the following paragraph summarizes the findings and conclusion section:

Given the contradictory significant results between the five engagement scales versus those by individual survey items, the researcher concludes that it would be a misinterpretation to make a general conclusion about whether the NSSE results for first-year respondents (UR) over or underestimate the level of engagement of the entire population of first-year students. Evidence of nonresponse bias does exist, as well as the fact that the assumption that the respondents' (UR) data represent the entire population is suspect. However, an alternative approach to answer whether the first-year respondents (UR) are either more or less engaged than the first-year non-respondents (SR) is to compare the respondents and non-respondents by each survey item, for both engagement scale and non-scale items. Only by this means can the institution know for sure the complete nonresponse bias situation as well as comparative levels of student engagement. A nonresponse bias study that includes a comparison of both socio-demographic variables as well as by survey items offers comparative data from which to assess student

learning and engagement at their specific institution. It is through this comparison that the institution can pinpoint specific areas for improvement in educational practice and student development.

### *Implications of the Findings*

The implications of this study are two-fold. The first is related to the field of survey methodology and nonresponse bias testing. The second provides insights into non-respondents and the less-engaged students at the institution surveyed with strategies for improvement in these areas.

### *Nonresponse Bias Implications*

Perhaps the most controversial implication of the study findings is that it resolves the underlying issue of generalizability of the NSSE results with an average response rate in the low 40 percent range. Despite the fact that the Student-Faculty Interaction Scale, and some individual survey items, did show evidence of nonresponse bias (indicating that the assumption that the respondents' (UR) data represent the entire population is suspect), the first-year respondents and first-year non-respondents were generally similar on socio-demographic factors as well as their levels of engagement. However, males and resident students were under-represented in the study respondent group. The similarity was certainly true for all engagement behaviors associated with the Level of Academic Challenge Scale and for most of those associated with the other four scales. Overall, it appears then that the first-year student NSSE 2004 responses for the items on the Level of Academic Challenge Scale are more valid for university assessment and subsequent policy-making.

A sub-issue of this implication is that for this conclusion to occur a nonresponse bias study must be conducted. It is through the comparison of respondents and non-respondents that institutions can arrive at this answer. Conducting nonresponse bias studies allows for more informed decision-making on behalf of the institution when utilizing survey findings for improvements in educational practice. This additional data could decrease misinterpretation of the NSSE results.

Another implication of the study findings is that nonresponse bias cannot solely be measured by engagement scales in the case of the NSSE, nor by other scale constructs for other student surveys. The NSSE engagement scale findings indicated nonresponse bias only for one scale with the non-respondents more engaged than the respondents. Nevertheless, the results of this study have demonstrated the importance of a micro-level analysis of all survey items in addition to the macro-level engagement scale analysis. When comparing the respondents and non-respondents by survey item, the analysis offered insight into exact behaviors where bias was measured and where the non-respondents were more or less engaged. Such information is highly valuable to the institution surveyed in order to target resources for improvement in student learning and development.

One unanticipated outcome of the data analysis was that the individual survey items would play such an important role in both offering evidence of nonresponse bias and insight into the level of student engagement. Initially, the additional analyses of the non-scale individual survey items were not included in the research hypotheses. The statistical results, however, of the comparisons between the first-year respondents and

first-year non-respondents on all individual survey items, clearly demonstrated the value of conducting a complete survey comparison.

The final implication related to nonresponse bias studies is that this study also offered an example of the benefits of conducting a local over-sample nonresponse bias study at one specific NSSE participating institution, in contrast to a national-level study. Even though the survey is the same, each NSSE participating institution's population is distinct. Respondent/non-respondent comparative results and analyses need to be locally conducted and applied.

### *Engagement Implications*

There are numerous implications of the findings that focus specifically on insights into the attitudes, needs and behaviors of the non-respondents as well as those less engaged students at the institution surveyed.

The findings of this study indicate the need for the institution surveyed to develop survey response marketing and motivational strategies targeted to the following first-year sub-populations: males, students residing on campus, and students whose major is "undecided." These were the groups under-represented in the study respondent group and are the serious non-respondents. For example, the institution could get these students to work on a NSSE pre-administration awareness campaign through a course they might have together, a club in which they might be active, or through an activity on their dorm floor (Cruce, Kinzie & Shoup, 2005).

The findings for the significant survey items of the Enriching Educational Experiences Scale indicate the need to increase engagement among the first-year non-respondents in the area of working toward career goals. Activities related to career are

significant motivators for student engagement. Opportunities to increase career exploration and development opportunities within course curriculum or the college environment after classes would be a valuable objective for the surveyed institution.

In addition, items in the Enriching Educational Experiences Scale indicated that more education and information concerning foreign cultures, languages and an emphasis on a deeper knowledge of cultural diversity in general would assist this institution in fostering more engagement and understanding in these areas. Global understanding and involvement is crucial for the future.

The finding that the first-year non-respondents, even after eight months more experience on campus, feel that the institution does not provide enough support for them to thrive socially should be looked into by the institution surveyed. Action research, through qualitative interviews and focus groups, could clarify what students understand by “to thrive socially” and inform the institution what support they feel is missing. Ultimately, this would benefit the first-year students’ adjustment, engagement, and ultimately their academic success given the inter-relationship between social and academic engagement (Pascarella & Terenzini, 1991, Tinto, 1993). Perhaps linking involvement in social activities (service learning, volunteering, extra-curricular clubs, etc) to course curriculum would initiate such social involvement earlier. Faculty commitment and involvement in planning such opportunities is crucial.

The researcher has identified several implications based on the findings where the non-respondents (SR) were more engaged on NSSE significant individual items. The larger mean for the non-respondents indicates that, with the passage of time (halo-effect and time lapse limitations), students do participate or grow interested in these

engagement-related activities. Two items described direct behavior on part of the faculty: “Received prompt feedback from faculty on your academic performance” and “Work on a research project with a faculty member.” Given that these two items were associated with the Study-Faculty Interaction Scale, the one engagement scale that measured nonresponse bias as a scale, it would greatly benefit the institution surveyed to inquire further into these two significant issues (significant both in statistical and engagement terms!). Especially for the first item, it would be beneficial to inform the first-year professors of this finding and identify with them when and how they can increase “prompt feedback” on their students’ performance, i.e. strategies using email, required meeting with professor. This training could be offered through a faculty development workshop. A mid- and end-of-semester assessment on faculty feedback would encourage faculty accountability.

Other findings dealt with behaviors initiated by the students: “Worked with classmates outside of class to prepare class assignments,” “Attended art exhibit or theatre performance,” “Participated in activities to enhance spirituality.” The institution surveyed could benefit from assessing how these activities, which all increase engagement, are offered/presented to first-year students and work to improve information and involvement earlier and perhaps more often in their first year. One way would be to link these activities to academic curriculum in the first-year or as dormitory social activities, similar to the “learning community” approach.

In addition, the researcher identified several implications based on the findings where the non-respondents (SR) were less engaged on NSSE significant individual items, whether scale or non-scale. Twenty of those were non-scale items. Their large number

alone led the researcher to believe that important insight would be gained through further inquiry in these areas by the institution surveyed.

Specifically, the findings concerning the academic behaviors, study skills, and computer use measured by the non-scale items indicate the need for the institution surveyed to assess what skills are lacking in first-year students and to increase training sessions for practice in these areas. This can be done both as part of the curriculum and in volunteer workshops. The non-respondents (SR) agree with the respondents (UR) that the institution academically challenges the students, but the difference in their survey responses indicate they believe their institution does not offer opportunities to develop the skills to be successful when responding to those challenges.

In addition, the findings that the non-respondents (SR) were less engaged on the non-scale topics dealing with understanding oneself and working effectively with others indicate the need for more opportunities in team building, conflict resolution, personal ethics and personal goal development training for the students. First-year experience courses or first-year seminars would be logical program locations for such learning experiences.

And finally, as discussed earlier, the first-year non-respondents (SR) did not have the same views as the first-year respondents (UR) concerning their overall experience at the institution surveyed. The “poor to fair” evaluation from the non-respondents (SR) of the quality of academic advising underscores the need for additional assessment and improvement in this important area. The behaviors and relationships involved in faculty-student advising impact many engagement and learning issues. In addition, the non-respondents’ (SR) “poor to fair” rating on questions concerning their entire educational

experience at the institution surveyed, and the fact they reported that they would “Probably not” attend there again, clearly raises doubts that the non-respondents (SR) have similar, or might even have slightly higher, engagements levels as the respondents (UR) (contrary to the finding for Research Hypothesis Two). These findings, together with the quantity of non-scale items where non-respondents (SR) scored less engaged than respondents (UR), tend to indicate that the respondent (UR) data are biased in the direction of over-estimation rather than under-estimation.

The implication of these contradictory findings further underscores the need for each participating NSSE school to conduct a nonresponse bias study using the complete survey, item by item, in order to pinpoint exact issues of nonresponse bias. In the last analysis, the study has shown that a general conclusion concerning whether or not nonresponse bias exists and if the respondent data are generalizable to the population surveyed is less important than where such bias exists. Such detailed comparative information will provide the institution with additional data from which to analyze and subsequently improve their community for their constituents, but above all, and specifically in this case, for the betterment of their first-year students.

#### *Limitations of the Study*

Despite the exemplary role that this study plays as the first local over-sample nonresponse bias study for the NSSE, as well as demonstrating the importance of conducting survey nonresponse bias studies, this study did contain several limitations.

First, the population for this study was limited to first-year students at one regional Catholic university. Generalization of the results might be able to lend insight into first-year students at similar institutions; however, as is indicated below, due to the

limitations of self-reporting as well as the perspective that results of a nonresponse bias study reflect its specific population, the results should be officially generalizable only to this study's population.

This nonresponse bias student survey research was conducted with the NSSE survey instrument. The findings of this study should be restricted to discussion of nonresponse bias and theories of respondents and non-respondents of the NSSE. As explained in the literature review, each survey distribution needs to have its own nonresponse bias study and findings should not be generalized to other surveys.

A specific limitation that needs to be considered for all NSSE surveys (Hicks & Lerer, 2003) is that by spring semester, when the survey is administered, the students who were least engaged are probably no longer enrolled. Survey results are biased by their absence.

Two additional limitations deal with the process of student self-reporting and its related halo effect (Thorndike, 1920). As discussed in Chapter Two, the validity of student self-reports has been agreed upon under specific conditions (Baird, 1976; Lowman & Williams, 1987; Pace 1985; Pike 1989, 1995; Pohlman & Beggs, 1974; Turner & Martin, 1984). However, other researchers reported concern for using them as proxies for achievement measures (Osterlind, Robinson, & Nickens, 1997; Pascarella, 2001b; Pike 1995, 1996), while more recent studies (Anaya, 1999; Pike, 1996, 1999) concluded that self-reported gains could be considered as proxies or "general "indicators" for outcome measures of the students' college experience. Nevertheless, these researchers indicated caution in comparing student self-reports from more than one institution (Pike,

1996). This recommendation further supports the first limitation of not recommending generalizability to different institutions.

Thorndike's (1920) halo effect occurs when students inflate their self-reported gains. Since studies (Pike, 1993, 1999) found halo error more pronounced for first-year students than older ones, its effect may play a role in how students responded to both the university survey and this study's survey. It is possible that some first-year students inflated their self-reported answers on the university survey, while eight months later the study respondents might not have done so. This is due to the fact that older students have more experience and training in self-evaluation than first-year students (Pike, 1999).

Since, "using fewer than 20 responses threaten the statistical power to detect differences between respondents and non-respondents" (Lindner, Murphy & Briers, 2001, p. 243), it is helpful to work with the largest number of responses for a nonresponse bias study. The study's 26.6 % response rate, with  $n = 25$ , is a possible limitation. Additional survey completion follow-up reminder procedures (Dillman, 1978, 1991, 2000; Porter, 2004b), such as a series of telephone contacts as well as visits to the student's dorm room, might have increased the number of student respondents to this study. Despite the fact that the goal of nonresponse bias studies is not to obtain a high response rate but to conduct a statistical comparison of the respondent groups, a larger sample size might have lessen the threat to statistical power to detect differences.

Lastly, and certainly not least, is the limitation of the time lapse between the spring semester NSSE 2004 survey and this nonresponse bias study survey. Technically, survey professionals recommend that a nonresponse bias study follow the original survey within a few months of the deadline on the original survey. The detailed and complicated

study proposal and IRB acceptance timeline process detained the researcher from distributing the study survey until eight months after the original survey return date. When an extended time lapse occurs, there are more life experience factors that may influence the responses to the survey items and hence affect the results of the statistical comparisons used to measure nonresponse bias.

#### *Recommendations for Future Research*

The results of this study were not straight-forward. There did not appear to be much difference between respondents and non-respondents, when the five engagement scales were analyzed. However, due to micro-testing on the survey individual items, evidence exists that the non-respondents were different than respondents for level of engagement on numerous survey items. In sum, the assumption that the NSSE 2004 first-year respondents' data represent the entire population is suspect.

In order for other NSSE participating institutions to obtain similar insight into their NSSE data and to test for representativeness of the respondents' data to the population, replication of this type of nonresponse bias study is not only recommended, it is imperative; that is, studies where both socio-demographic differences are measured, and responses to the original survey are compared between respondents and non-respondents are necessary. Replication of this study would be useful to both strengthen and cross-validate its findings with other NSSE participating institutions. Moreover, it is the hope of the researcher that this study be a wake-up call for educational administrators and researchers to return to the empirical practice of conducting nonresponse bias studies with all student surveys, regardless of the response rate. Recommendations for such studies are as follows:

*Methodological Changes*

1. Based on prior discussion concerning the time lapse limitation, it is recommended to conduct student survey nonresponse bias tests within a few months after the original survey distribution return date. The sooner the follow-up study is conducted, the less likely life experiences will be able to affect the responses of the students.

2. In order to increase response rates, student survey experts recommend survey completion follow-up reminders via telephone calls and in-person dormitory visits. For future student nonresponse bias studies, these and other techniques and design factors from Dillman's Total Design Method (Dillman, 1978) could be included as strategies to increase the nonresponse bias study response rate.

3. This study was limited to answering the question of evidence of nonresponse bias through quantitative methods. Quantitative measures of group comparisons did not reveal the attitudinal, personal and social factors behind student nonresponse behavior. Qualitative open-ended questions could have explored why the students did not respond to the original survey and what strategies or factors could have motivated them to do so. Such information is vital if institutions are going to continue to utilize student self-report surveys for outcomes assessment and institutional improvement. Therefore, a nonresponse bias research methodology that combines quantitative and qualitative methods could provide deeper insight and additional information into the issues of nonresponse bias, nonresponse behavior, and the improvement of student surveys, to ultimately increase the level of student engagement on college campuses.

Carifio (1987), based on his community college student nonresponse bias study, proposes using the following eight items in addition to the survey questions, to gain

insight concerning why students did not respond to the original survey: (a) Forgot, (b) Did not want to complete survey, (c) Misplaced survey, (d) Did not like survey, (e) Did not like their college, (f) Did not understand survey, (g) Never received survey, and (h) Mailed back survey. In addition, “interest in the topic” (Green, 1990) of the survey could be a theme of several questions. These questions lend themselves to either a quantitative or qualitative approach. However, a qualitative telephone follow-up study of the non-respondents, expanding upon these additional questions, would be of substantial benefit to higher education decision-makers interested in improving student surveys and student response rates.

#### *Other Studies*

4. Future research could replicate the same seven socio-demographic variables, as they were chosen due to accessibility of data, or add ones related to the institution’s interests. Additional socio-demographic variables would enhance the understanding of respondents and non-respondents; for example, Porter & Whitcomb (2004b) included whether the student is on financial aid, and the student’s personality type. Additional academic variables related to QPA, such as achievement test scores, could lend more insight into the contradictory findings on survey response and academic achievement. In addition, Carifio (1987) added a “special needs” variable and an “employment status” variable for comparison. Given the changing demographics of today’s students where more are working and there is an increase of students with learning and emotional challenges, these variables are recommended for comparisons in future studies.

In any case, it is recommended that special attention be given to the variables “place of residence,” “gender,” and whether the student is “undecided” with major of

study, because these were the groups under-represented in the study respondent group. In addition, it is recommended also to try to obtain more complete data on parents' education level for comparisons of all groups.

5. Even though this study focused solely on the first-year students, the NSSE is distributed to both first-year and senior students. Data analysis on senior students would offer a more complete picture of respondent data representativeness and student engagement levels across age groups attending the institution. This study merits replication at other NSSE participating institutions including a comparison of senior respondents and senior non-respondents. Strict attention to the shortest time lapse possible is recommended in the methodology, in order to be able to reach as many senior student non-respondents as possible before they move away from known addresses.

6. It is highly recommended that many institutions that use the NSSE conduct their own nonresponse bias tests to compare results among NSSE users. Attention to diverse types of institutions is important to obtain a good cross-section, as well as targeting similar institution types for common factor comparisons. Despite findings on survey individual items, more research is needed to see if there is a trend, based on the five engagement scales, where the non-respondents seem to be slightly more engaged than the respondents.

7. Given that the only engagement scale with a statistical significant mean difference was the Student-Faculty Interaction Scale, it would add value to conduct a random sample survey of the faculty of the surveyed institution using the Faculty Survey of Student Engagement (FSSE) (Indiana University Bloomington, 2006) to obtain faculty perceptions of this area. The FSSE measures faculty expectations of student engagement

and what they value in educational practices that are empirically linked with high levels of learning and development. Furthermore, it would be interesting to then compare the results of the two engagement surveys in order to measure differences in their perceptions, as well as any relationships between these two groups which form the two sides of the equation for this engagement scale. Examples of FSSE comparisons to student responses on the NSSE can be found on the NSSE website (Indiana University Bloomington, 2006). Comparative results would further assist with institutional improvement to increase student learning and engagement.

#### *Conclusions Summary*

This study contributed both empirically and theoretically to the literature on nonresponse bias in survey methodology as well as that of assessment of undergraduate learning and development. The follow-up over-sample nonresponse bias study approach, comparing non-respondents and respondents on socio-demographic variables as well as on survey items, serves as a replicable empirical example whose practice has been absent from survey methods. Nevertheless, it is important to emphasize again that each survey's nonresponse bias study is a reflection of that specific topic, instrument, and population studied and should not be generalized to another survey situation.

The most practical result of this comparison study is that it produced data that demonstrated the dual value of conducting nonresponse bias studies on student assessment surveys, and particularly on the National Survey of Student Engagement. First, it tested representativeness and external validity on responses. The socio-demographic comparisons reported no significant difference between respondents and non-respondents on the seven tested variables. However, males, students residing on

campus, and those with “undecided” as a major of study were under-represented in the study respondent group. In addition, the findings identified one of five engagement scales and numerous individual survey items that suggest that the assumption that the original respondents’ data represent the entire population is suspect. It follows then that nonresponse bias does exist in these areas and that the institution surveyed may have either over- or underestimated the level of engagement of the entire population of first-year students by simply looking at the respondents’ results. This suggests that institutions need to be concerned about bias and factors that can lead to over-interpreted or misinterpreted conclusions. Also, this study showed that caution needs to be heeded when conducting a nonresponse bias study based solely on survey scale groupings.

The second practical value is that this study offers detailed knowledge into the level of engagement of non-respondents and identifies areas for institutional attention and improvement in educational practice, in other words, the engagement behaviors where the NSSE 2004 first-year non-respondents were significantly less engaged.

The ongoing student involvement and engagement research builds the case that student effort and involvement are the critical determinants of learning and development in college (Pascarella & Terenzini, 2005). This study provides direction to the institution surveyed concerning where they could consider focusing their resources to shape their academic, interpersonal, and extracurricular offerings to encourage student engagement. Such empirical practice and application of results contributes to the work of NSSE researchers and practitioners who are using student engagement outcomes to facilitate improvements in educational practices on many NSSE participating universities (see

Project Deep and NSSE Users conferences) (Indiana University at Bloomington, 2006; Kinzie, 2005; personal communication, Dr. Bob Smallwood, March 7, 2006).

From a theoretical perspective, this study offered a contribution to the evolving scholarship of assessment (Banta & Associates, 2002). Given the commitment to assessment in higher education, the increase in student surveys and the decrease in response rates, it is the hope of the researcher that this study will motivate interest to return to the use of the nonresponse bias study as a valuable survey and assessment tool. In this way, educational professionals can take steps to overcome the two barriers, related to this study, to “moving assessment forward” as identified by Banta (1997): (a) limitations of assessment tools and methods, and (b) insufficient involvement of students. The regular use of the nonresponse bias study can improve assessment in both instances.

And lastly, but certainly not least, this study has contributed to engagement as both the process and product of learning (Shulman, 2002). An increased use of the nonresponse bias test to improve NSSE results, coupled with the application of the NSSE student engagement outcomes to improve educational practice at institutions of higher education, will hopefully increase student engagement on college campuses which fundamentally support democratic engagement and individual development (Cameron, 2004). In the final analysis, through the lens of Social Foundations Inquiry, such experience will serve as a foundation for our young adults to be life-long learners and purposeful engaged citizens.

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Appendix A  
The College Student Report 2004  
NSSE Survey

Appendix B  
Survey Envelope

Appendix C  
Survey Cover Letter

1917 Deer Path Road  
Harrisburg, PA 17110  
[mcinnise@mhs-pa.org](mailto:mcinnise@mhs-pa.org)

January 10, 2005

Dear \_\_\_\_\_,

I am a doctoral candidate at Marywood University in Scranton, Pennsylvania. My dissertation topic is the **National Survey on Student Engagement** and my focus is on the non-respondents to that survey from this past spring 2004. You have received this mailing because, for whatever reason, you are a member of the non-respondent group. With this second opportunity to respond to the survey, your participation will assist universities with information on the first-year of college and you will gain personal insight into your own engagement experience.

**I would sincerely appreciate your help in this study. Please respond by January 24, 2005.** Due to the relatively low response rate from the original survey administration in the spring, I am trying to get a 100% participation rate so that I can conduct a valid comparison between the initial respondents and the non-respondents. As a thank you, in advance I enclose a telephone calling card for your use.

I am conducting this research in an effort to measure nonresponse bias. In other words, the results will be used to clarify whether or not the original first-year respondents do in fact represent all first-year students. If they do not, because of your participation, universities will be able to have a more realistic insight into first-year students' experience and student survey response. **YOUR PARTICIPATION WILL HELP UNIVERSITIES BETTER UNDERSTAND STUDENTS AND SURVEY RESPONSE!**

Your response to this survey will be confidential in that all surveys will remain in the sole possession of the researcher and responses will be used to report group data only. Please contact me if this letter was received in error and I will remove your name from the non-respondent list.

I realize how limited your time is and sincerely appreciate your prompt response by January 15, 2005. If you have any questions please contact me at my email address above or call 717-545-1435. Thank you so much for your time and assistance.

Sincerely,

Elizabeth D. McInnis  
Marywood University  
Ph.D. Program

Appendix D  
Consent Form

Nonresponse bias in student assessment surveys: A comparison of respondents and non-respondents of the National Survey of Student Engagement at an independent comprehensive Catholic university

*Consent for Participation*

**What are the purpose and procedures of this research?** You are invited to participate in a doctoral dissertation research study on college student engagement, related to learning and development at Marywood University. If you decide to participate, your involvement will consist of reading, signing and returning this consent form and filling out and returning the enclosed survey, *The College Student Report*, in the enclosed envelope. Survey completion takes approximately 30 minutes.

**How was I chosen?** You have received this survey because you were a “non-respondent” to an identical survey in spring 2004. Due to one or a combination of reasons, Marywood University did not receive a completed survey from you last spring.

**What are the benefits of participation?** There are several expected benefits associated with your participation in this study. I hope that you take advantage of this second opportunity to participate in this important student survey because one principal benefit of your participation, and the main focus of the study, is that a comparison will be made of the spring 2004 student respondents and non-respondents. In this way, I will be able to measure whether survey results from student spring 2004 respondents truly represent all the students. **YOUR PARTICIPATION MAKES A DIFFERENCE!** It will help universities better understand first-year students’ experience and student survey response. An additional benefit to you is increased personal insight into your own engagement experience in college so that, if you choose, you can make changes in your behavior to improve your own learning and development.

**What are the risks?** There are no foreseeable risks to you as a result of your participation in the study. Your participation is completely voluntary and will not affect your current or future relationship with Marywood University. You will be free to refuse or stop filling out the survey at any time without penalty. All information will be confidential. All returned surveys will be kept in a locked file. Once data have been analyzed, all links to names and data will be destroyed. This project was approved by the Marywood University Institutional Review Board for the Protection of Human Rights.

If you have any questions, please feel free to contact me, Elizabeth McInnis, at (717) 545-1435 or [mcinnise@mhs-pa.org](mailto:mcinnise@mhs-pa.org). If you have any concerns, you may contact my doctoral committee chair, Sr. Gail Cabral, IHM, Ph.D., at Marywood University, (570) 348-6211, ext. 2346.

**Please read this entire form, and, if you agree to participate, please sign below,** indicating that you have full knowledge of the purpose of the study and the nature of the procedures and return this form with your completed survey to:

Elizabeth D. McInnis  
1917 Deer Path Road  
Harrisburg, PA 17110

Signature \_\_\_\_\_ Date \_\_\_\_\_

Appendix E  
Pre-Paid Incentive

INCENTIVE – Pre-Paid Survey Phone Card by Sprint/CVS Pharmacy

Every survey participant will receive a \$5 phone card with their survey packet. It is a pocket size plastic card that is used to pay telephone calls. It consists of 111 domestic minutes with no weekly or monthly fees. It also has reliable global connections. The rate is 9 cents per domestic minute and you can add more minutes to the card for continued use. If you add minutes in the CVS store, you will get 10% more minutes.

Appendix F  
Pre-Survey Postcard

## ATTENTION!! Marywood Students

**\*\*You have been chosen as a NSSE survey participant. Your opinion is important and your voice needs to be heard\*\***

- Step 1            You should receive the NSSE survey through the mail.  
Step 2            Take 30 minutes and fill out the survey and the consent form.  
Step 3            Return both in the envelope provided.  
Step 4            Enjoy using the enclosed telephone card to call friends or home!

### Helpful Hints

- Be honest with your answers.
- Fill out the survey and mail it as soon as possible.
- Contact Elizabeth McInnis at [mcinnise@mhs-pa.org](mailto:mcinnise@mhs-pa.org) if you do not receive the survey.

The return address will show  
in this area.

You may enter text and graphics in this  
Anything placed in the address area or  
clear zones will not be printed.

area.  
other

The address block will be  
printed here. Please do not  
place anything in this area.

This is a clear zone  
Do not place anything in this area

Appendix G  
Pre-Survey Email Message

## ATTENTION!! Marywood Students

**\*\*You have been chosen as a NSSE survey participant. Your opinion is important and your voice needs to be heard\*\***

- Step 1            In about one week you will receive the NSSE survey.
- Step 2            Take 30 minutes and fill out the survey and the consent form.
- Step 3            Return both in the envelope provided.
- Step 4            Enjoy using the enclose telephone card to call friends or home!

### **Helpful Hints**

- Be honest with your answers.
- Fill out the survey and mail it as soon as possible.
- Contact Elizabeth McInnis at [mcinnise@mhs-pa.org](mailto:mcinnise@mhs-pa.org) if you do not receive the survey in about a week.

Appendix H  
Post Survey Follow-Up  
Letter and Email Message

Date:

To:

Two weeks ago a survey was mailed to you concerning your first-year experience at Marywood University. Because of the National Survey on Student Engagement provides universities with vital information to improve student learning and programs, your response is very important. In addition, I too am a Marywood student and this survey is part of my doctoral research for my Ph.D. at Marywood. I really hope you participate!

If you have already completed and returned the survey and the consent form, please accept my sincere gratitude and thanks. If not, please do so soon as I am trying to get a 100% participation rate. I am conducting this research in an effort to help universities better understand first-year students' experience and student survey response. In addition, by participating you will gain personal insight into your own first-year experience. I greatly appreciate time taken from your busy schedule.

If you did not receive a survey, or if it has been misplaced, I am enclosing another copy for your use.

Hope you are enjoying the phone card. Thank you for your most valuable assistance in my research.

Sincerely,

Elizabeth D. McInnis  
Doctoral Candidate  
Marywood University

Appendix I  
Permission Letters from Deans  
of Participating University's Colleges

Appendix J  
Email Permission from Participating University's  
Office of Planning and Institutional Research

Appendix K  
Email Concerning Permission from NSSE Office at  
Indiana University Bloomington's Center  
for Postsecondary Research

Appendix L  
Post-Survey Participant Thank-You Note

Dear \_\_\_\_\_

I want to personally thank you for participating in my doctoral research by filling out the National Survey on Student Engagement. It meant so much to me to be able to have a good response rate and, because you took the time to answer the survey, that was possible. I hope you received some insight from the process of answering questions on your engagement at Marywood and also put the telephone card to good use! Again, if you have any questions on the survey results do not hesitate to contact me at (717) 545-1435 or [mcinnise@mhs-pa.org](mailto:mcinnise@mhs-pa.org)

Gratefully yours,

Appendix M  
Survey Items Contributing to the Five NSSE  
National Benchmarks of Effective Education Practice  
(Engagement Scales)

## NSSE Benchmarks

### **Level of Academic Challenge**

Challenging intellectual and creative work is central to student learning and collegiate quality. Colleges and universities promote high levels of student achievement by emphasizing the importance of academic effort and setting high expectations for student performance.

### **Level of Academic Challenge Items:**

Preparing for class (studying, reading, writing, rehearsing, etc. related to academic program)

Number of assigned textbooks, books, or book-length packs of course readings

Number of written papers or reports of 20 pages or more; number of written papers or reports of between 5 and 19 pages; and number of written papers or reports of fewer than 5 pages

Coursework emphasizing analysis of the basic elements of an idea, experience or theory

Coursework emphasizing synthesis and organizing of ideas, information, or experiences into new, more complex interpretations and relationships

Coursework emphasizing the making of judgments about the value of information, arguments, or methods

Coursework emphasizing application of theories or concepts to practical problems or in new situations

Working harder than you thought you could to meet an instructor's standards or expectations

Campus environment emphasizing time studying and on academic work

### **Active and Collaborative Learning**

Students learn more when they are intensely involved in their education and asked to think about what they are learning in different settings. Collaborating with others in solving problems or mastering difficult material prepares students for the messy, unscripted problems they will encounter daily during and after college.

### **Active and Collaborative Learning Items:**

Asked questions in class or contributed to class discussions

Made a class presentation

Worked with other students on projects during class

Worked with classmates outside of class to prepare class assignments

Tutored or taught other students

Participated in a community-based project as part of a regular course

Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.)

### **Student-Faculty Interactions**

Students learn firsthand how experts think about and solve practical problems by interacting with faculty members inside and outside the classroom. As a result, their teachers become role models, mentors, and guides for continuous, life-long learning.

### **Student-Faculty Interactions Items:**

Discussed grades or assignments with an instructor

Talked about career plans with a faculty member or Advisor

Discussed ideas from your readings or classes with faculty members outside of class

Worked with faculty members on activities other than coursework (committees, orientation, student-lifeactivities, etc.)

Received prompt feedback from faculty on your academic performance (written or oral)

Worked or planned to work with a faculty member on a research project outside of course or program requirements

### **Enriching Educational Experiences**

Complementary learning opportunities in and out of classroom augment academic programs. Diversity experiences teach students valuable things about themselves and others. Technology facilitates collaboration between peers and instructors. Internships, community service, and senior capstone courses provide opportunities to integrate and apply knowledge.

### **Enriching Educational Experiences Items:**

Participating in co-curricular activities (organizations, publications, student government, sports, etc.)

Practicum, internship, field experience, co-op experience, or clinical assignment

Community service or volunteer work

Foreign language coursework & study abroad

Independent study or self-designed major

Culminating senior experience (comprehensive exam, capstone course, thesis, project, etc.)

Serious conversations with students of different religious beliefs, political opinions, or personal values

Serious conversations with students of a different race or Ethnicity

Using electronic technology to discuss or complete an Assignment

Campus environment encouraging contact among students from different economic, social, and racial or ethnic backgrounds

**Supportive Campus Environment**

Students perform better and are more satisfied at colleges that are committed to their success as well as the working and social relations among different groups on campus.

**Supportive Campus Environment Items:**

Campus environment provides the support you need to help you succeed academically

Campus environment helps you cope with your non-academic responsibilities (work, family, etc.)

Campus environment provides the support you need to thrive socially

Quality of relationships with other students

Quality of relationships with faculty members

Quality of relationships with administrative personnel and offices