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Impacts of Website Visibility and Family Income on Use of the Net Price Calculator

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Impacts of Website Visibility and Family Income on Use of the Net Price Calculator

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In partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Education and Social Change

April 17, 2014

Dissertation directed by

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by

Hunt Chouteau Helm

BELLARMINE UNIVERSITY

The Annsley Frazier Thornton School of Education of Bellarmine University certifies that Hunt Chouteau Helm has successfully defended his dissertation for the degree of Doctor of Philosophy in Education and Social Change as of April 17, 2014. This is the final and approved form of the dissertation.

Impacts of Website Visibility and Family Income on Use of the Net Price Calculator

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Abstract of the Dissertation

Impacts of Website Visibility and Family Income on Use of the Net Price Calculator

Higher education attainment benefits individuals and society. But access to higher education is not equitable. Students from low-income families, even those with equal qualifications, are underrepresented throughout the education pipeline, and the gap by family income increases at each educational milepost. The major impediments to increasing college-going rates for lower-income families are financial, experiential, motivational and informational. A key informational impediment is the difficulty families have in understanding information about college costs and financial aid. In 2011, the federal government attempted to improve information access for all by requiring all colleges and universities to post a Net Price Calculator on their websites. The Net Price Calculator is an Internet tool that calculates a customized statement of the user's net tuition and net cost of attendance after financial aid and available loans. This study examines use of the Net Price Calculator in its first year at six private, non-profit, four-year colleges and universities, based on a total of more than 10,000 users' family income levels, and the tool's visibility on the schools' websites. Using a chi-square analysis with three levels of family income and two levels of website visibility, the results suggest that prospective students at these six schools were almost nine times more likely to use the Net Price Calculator if it was highly visible on the institution's website, and that lower income students were about twice as likely to use it as were middle-income or high-income students, regardless of its website location. The study suggests that the Net Price Calculator may have the potential to help close the information gap that has been an obstacle for some lower-income students in access to higher education, and calls for further research.

Key words: Higher education, low-income students, Net Price Calculator, website visibility.

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CHAPTER 1:

INTRODUCTION

An extensive body of research establishes the value of higher education attainment to individuals and to society (Baum, Ma, & Payea, 2010; Baum & Payea, 2013; Carroll, 2010; Dee, 2003; Haveman & Smeeding, 2006; Jacobson & Mokher, 2009; Long, 2010). College graduates are more likely than others to have jobs and job satisfaction, pension and health benefits; to have healthier lifestyles and lower health-care costs; to prepare their children for education and to be engaged in their children's schooling (Baum, Ma, & Payea, 2010). College graduates earn more than twice as much as high school graduates (Haveman & Smeeding, 2006).

Equity in higher education is therefore vital to reducing economic inequality and the transmission of poverty from generation to generation (Jacobson & Mokher, 2009). Political science research meanwhile documents a strong correlation between educational attainment and benefits to society, including deeper civic engagement, increased tax revenue and lower spending on social programs (Baum, Ma, et al., 2010; Carroll, 2010; Dee, 2003).

Overview of the Problem

Students from low-income families are underrepresented throughout the education pipeline and the gap by family income increases at each educational milepost through high school and college (Jacobson & Mokher, 2009). College enrollment rates are rising overall, but income-related gaps in college attendance and in college graduation rates are large and persistent (Avery & Kane, 2004; Baum, Ma, et al., 2010; Haveman & Smeeding, 2006; Jacobson & Mokher, 2009). Even students with equal effort and ability are less likely to attend college if they are from a lower socioeconomic background (Carnevale & Rose, 2003; Elliott & Lewis, 2013; Hahn & Price, 2008; Handel, 2014; Kane, 2004).

Jacobson and Mokher (2009) identified four major, student-related impediments to increasing postsecondary enrollment rates for lower-income students: financial, experiential, motivational and informational. A financial impediment is a lack of funds needed to pay for tuition, fees, books, living expenses and transportation, as well as the indirect cost of loss of income should the student pursue postsecondary education instead of going to work. An experiential impediment relates to a systemic lack of academic preparation in high school. A motivational impediment relates to lack of interest in entering different career fields (Jacobson & Mokher, 2009). The information gap impediment includes lower-income families' difficulty in accessing and understanding information about college costs and financial aid (Jacobson & Mokher, 2009; Perna, 2006; Perna & Jones, 2013; Sturtevant, 2010).

The federal government's requirement (Higher Education Opportunity Act, 2008) that all colleges and universities post a Net Price Calculator on their websites by October, 2011, was widely anticipated by policy makers and researchers as a potentially effective way to help close the information gap (Cheng, 2011; Lapovsky, 2011; Long, 2010; Parrott & McWade, 2010; Piccioli, 2012; Sturtevant, 2010). The Net Price Calculator is an on-line tool that enables students and families to provide financial information, academic qualifications and other information in order to get an estimate of financial aid eligibility, loan eligibility and net cost of attending college. While all colleges and universities are required to have a Net Price Calculator on their websites, there are no requirements with respect to where it is located on the website or how easy it is to find (Higher Education Opportunity Act, 2008), and even a cursory Internet search of college and university websites shows that there is variance in the location and website visibility of the Net Price Calculator across institutions.

There is also variance across income groups as to how the Internet is used to access information (Zickuhr and Smith, 2012). These researchers with the Pew Internet Project found that increased Internet access and the proliferation of mobile devices have virtually eliminated the “digital divide” with respect to gaps in access to the Internet across income groups. However, lower-income families are more likely to access the Internet through mobile devices such as smart phones and tablets, and less likely to have high-speed broadband in their homes (Zickuhr & Smith, 2012). In addition, the authors found that lower-income groups are less likely to use the Internet for purposes such as on-line banking and shopping. Daun-Barnett and Das (2013) suggested that these differences might perpetuate the college choice information gap. They studied content-rich but complicated college search web portals (such as the Mentor sites sponsored by Xap, Inc.; the College Board student portal; and college.gov, sponsored by the U.S. Department of Education) and suggested that these interactive repositories of information might be more beneficial to higher-income students than to lower-income students (Daun-Barnett and Das, 2013). However, their study did not examine the Net Price Calculator that is required on institutions’ websites.

Need for the Study

Research suggests that one impediment to college access for low-income students is a gap in the acquisition and use of information about tuition and financial aid (Jakobson & Mokher, 2009; Perna, 2006; Sturtevant, 2010). The federal requirement that all institutions of higher learning post a Net Price Calculator requirement on their websites was intended to improve consumer transparency and to make access to information about tuition and financial aid available to all (Higher Education Opportunity Act, 2008). However, a review of the extant literature since the Net Price Calculator requirement went into effect in 2011 indicates a gap in

the research with respect to whether the Net Price Calculator has potential to help close the information gap, or whether it will be yet another source of information about tuition and financial aid that higher-income students are more likely to find and use. One new area for study, therefore, is how colleges and universities have deployed the Net Price Calculator, where it is located on their websites, and the extent to which prospective college students of differing income levels are finding and using this new tool to gain information about access to college. The results not only could have implications for enrollment marketing and policy decisions within higher education institutions, but also could inform federal policy going forward.

Background

The college choice process that students and families undertake is complicated by issues of access since access to college and to information about college is not equitable across income groups (Avery & Hoxby, 2004; Avery & Kane, 2004; Baum, Ma, et al., 2010; Bergerson, 2009; Beyer, 2012; Dynarski, 2000; Jacobson & Mokher, 2009; Kane, 2004; Perna, 2006).

Understanding financial aid in order to find a student's net price for tuition after taking into account all scholarships, grants, work-study opportunities, and loans, can be among the most difficult obstacles in the college admissions process (Parrott & McWade, 2010; Sturtevant, 2010). Students from families of lower socioeconomic status are less likely to understand the college application process, and less likely to estimate accurately the cost of attending college, than are students from higher-income families (Avery & Kane, 2004; Haveman & Smeeding, 2006; Plank & Jordan, 2001; Tierney & Venegas, 2009). For many of these lower-income families the financial aid system is so complicated that the information is extremely difficult to access and understand (Sturtevant, 2010). In fact, in a recent poll, 59% of families said they eliminated

colleges from consideration based on published tuition price alone, without exploring financial aid opportunities (Student Poll, 2010).

In order to empower consumers with actionable information (Long, 2010), the federal government required all colleges and universities in the United States to post a Net Price Calculator on their websites beginning in October, 2011 ("Higher Education Opportunity Act," 2008). With the Net Price Calculator mandate, widely viewed as a breakthrough in consumer transparency (Parrott & McWade, 2010), students are able to enter data about their academic qualifications and family finances to receive an immediate estimate of how much they might expect to be awarded in financial aid. This is automatically subtracted from the published tuition to generate an estimate of that student's net price of attending that school.

In this way, some lower-income students might learn that it would cost them less to enroll at a more expensive four-year private university they had thought to be out of reach, than at their local community college (Lapovsky, 2011). Others suggested that the primary users of the Net Price Calculator would be students from higher-income families who would use the information in negotiations with institutions for more merit aid (Fallon, 2011). Beginning for the first time in fall 2011, all students who use the Net Price Calculator have been able to compare personalized estimates of what their costs would be at different schools, and also to compare their likely actual cost to the published tuition and cost of attendance at any individual school; and they have been able to do so earlier in the college choice process (Fallon, 2011; Lapovsky, 2011; Piccioli, 2012). But how easy is it to find the Net Price Calculator on any given institution's website? Research into information foraging theory informs web navigation models, and suggests that people forage for information in much the same way that animals forage for food. Just as birds seek berries within patches and between patches, people seek information in

one location and, if they don't find it there, they abandon that location and move to another (Pirolli & Card, 1999).

Research Questions

Growing out of and guided by research in the field of higher education equity, specifically equity in information about college tuition and financial aid, this study examines the first enrollment cycle of data captured from a total of more than 10,000 completers of the Net Price Calculators at six private, not-for-profit, four-year colleges and universities, to understand the use of this new tool by family income level and by the visibility of its location on institutional websites. The research questions guiding this study are:

1. Does high website visibility impact use of the Net Price Calculator?
2. Does family income impact use of the Net Price Calculator?
3. Is there an interaction between website visibility and family income in use of the Net Price Calculator?

Definitions of Terms

The term *high visibility* is defined for purposes of this study as having the hyperlinked words "Net Price Calculator" on the home page or one click from the home page on the Admissions landing page. (At some institutions, the Admissions landing page is, in effect, the home page for prospective students). The other group has Net Price Calculators that are not located as prominently on their websites. The term *lower visibility* is defined for purposes of this study as having the hyperlinked words "Net Price Calculator" at least two clicks away from the home page. For purposes of this study, the term *family income* is defined as parents' adjusted gross income plus student's adjusted gross income as reported on the Net Price Calculator. Family income is divided into three levels, Low, Medium and High. The cut points for these

levels are derived by combining household income quintiles (U.S. Census Bureau, 2010) as follows:

- Low income: < \$39,212
- Medium income: \$39,212 - \$99,891.
- High income: > \$99,891.

Assumptions and Limitations

This study will be limited to usage data from six four-year, private, not-for-profit colleges and universities of similar size and selectivity. It is also limited to use of the version of the Net Price Calculator provided by Student Aid Services, a private vendor, which supplied the anonymous raw usage data for this study. Because the Net Price Calculator is an open-access tool that can be used repeatedly without preregistration, the data may include repeat users. This study does not compare this version of the Net Price Calculator to the free federal version, to other vendors' versions, or to versions that institutions might design for themselves. It does not examine the accuracy of Net Price Calculators with respect to actual financial aid awards. It does not examine how early in the college search process students are accessing the Net Price Calculator. And it does not study the impact of the Net Price Calculator on any school's enrollment numbers or its impact on higher education stratification in general. All of these areas remain for further study.

Summary and Chapter Overview

Based on the first full year of Net Price Calculator data at six similar schools, totaling more than 10,000 users, this dissertation provides initial insight into the tool's potential to help close the financial-aid information gap identified in research as a major impediment that lower-income students and their families face in the college choice process. The results of this study

should help higher education administrators who are interested in socioeconomic equity to understand who uses the Net Price Calculator, and to consider whether to view it as a marketing opportunity and not merely as a federal compliance issue. It might also inform federal policy in terms of recommendations or requirements about the location of the Net Price Calculator on institutional web sites.

Chapter 2 reviews the relevant literature and identifies a conceptual model (Perna, 2006) for understanding the information-gap problem. The relevant literature first establishes the value of higher education to individuals and to society, and documents the lack of equity and access to higher education for lower-income students. It explores the impediments to higher-education attainment among lower-income students, one of which is the lack of access to information about financial aid and affordability that provides context for the present study. The literature examines the emergence and purpose of the federal Net Price Calculator requirement as a means of improving consumer transparency and information about college affordability. The conceptual model proposes a way of understanding why there are differences across groups in the ability to access and use available information about tuition and financial aid. Chapter 3 sets out the research methodology of the present study, offering and explaining definitions, research design and data selection. Chapter 4 reports the results of this study and Chapter 5 summarizes the findings, explores their implications and proposes future research.

CHAPTER 2: REVIEW OF THE LITERATURE

This literature review examines key research findings and concepts related to this study. In conducting this literature review, on-line data bases including ProQuest, EBSCOhost, JSTOR, Electronic Journal Finder and Google Scholar were searched for academic literature, scholarly journal articles, and books, using search terms such as higher education, poverty, college choice, social stratification, financial aid, equity, access, information foraging and Net Price Calculator. This review consists primarily of research and evaluative reports conducted since 2000 but includes some significant contributions from earlier years.

An extensive body of research suggests that higher education attainment is valuable to individuals and to society (Baum & Payea, 2013; Carroll, 2010; Dee, 2003; Haveman & Smeeding, 2006; Jacobson & Mokher, 2009; Long, 2010), that income-related gaps in higher education attainment appear persistent and help perpetuate poverty (Avery & Kane, 2004; Baum, Ma, et al., 2010; Haveman & Smeeding, 2006; Jacobson & Mokher, 2009), and that one key impediment to higher education attainment appears to be lower-income families' difficulty in accessing and understanding information about college costs and financial aid (Jacobson & Mokher, 2009; Perna, 2006; Sturtevant, 2010).

In an effort to improve access to information about tuition and financial aid, the federal government required every college and university in the United States to post a Net Price Calculator on its website beginning in 2011 (Higher Education Opportunity Act, 2008). The Net Price Calculator was intended to enable students and families to enter academic, financial and other information in an on-line form and calculate an estimation of financial aid and loans for which the student would be eligible, resulting in an estimated net price that the student would need to pay to attend that institution. The advent of the Net Price Calculator and the variance in

its location and visibility across institutional websites raise the question of whether it has the potential to help close the information gap that is one key impediment to higher education attainment for lower-income students (Lapovsky, 2011), or whether it might be just another source of information that higher-income students are more likely to use (Fallon, 2011). The research questions guiding this study are:

1. Does website visibility impact use of the Net Price Calculator?
2. Does family income impact use of the Net Price Calculator?
3. Is there an interaction between website visibility and family income in use of the Net Price Calculator?

The research literature that invites this study covers the value of higher education, social stratification in higher education, issues of equity and access in the college choice process, impediments faced by lower-income students, and expectations for the Net Price Calculator. It identifies a conceptual model (Perna, 2006) that provides a framework for understanding the reasons for differences across groups in access to information about financial aid.

The literature surveyed describes the value of a college degree as an indicator of future economic success (Baum, Ma, & Payea, 2010; Baum & Payea, 2013; Carroll, 2010; Dee, 2003; Haveman & Smeeding, 2006; Jacobson & Mokher, 2009; Long, 2010). It describes a stratified higher-education environment in which qualified students of lower socioeconomic status face constraints in their quest to attain the credential (Baum, Ma, et al., 2010; Jacobson & Mokher, 2009; Handel, 2014). Constraints identified in the literature include a lack of access to information these students need to understand and engage the highly complex system of college admission and financial aid (Jacobson & Mokher, 2009; Perna, 2006; Sturtevant, 2010). The literature anticipating the Net Price Calculator suggests that it could be used as a tool to close

this information gap and thereby as one way to help improve equity and access in higher education (Cheng, 2011; Lapovsky, 2011; Long, 2010; Parrott & McWade, 2010; Piccioli, 2012; Sturtevant, 2010).

Value of Higher Education

A large body of research demonstrates the value of higher education to individuals and to society (Baum, Ma, et al., 2010; Carroll, 2010; Dee, 2003; Haveman & Smeeding, 2006; Jacobson & Mokher, 2009; Long, 2010). People with higher levels of education are more likely to be employed and are more likely to earn more, than people with lower levels of education (Baum, Ma, et al., 2010; Jacobson & Mokher, 2009). In one study, college graduates earned more than twice as much as high school graduates (Haveman & Smeeding, 2006). In another, median earnings of bachelor's degree recipients working full-time in 2008 were \$55,700, or \$21,900 more than median earnings of high school graduates (Baum, Ma, et al., 2010). People with some college earned 17% more than high school graduates (Baum, Ma, et al., 2010). In the last quarter of 2009, the unemployment rate for high school graduates ages 20-24 was 2.6 times higher than the unemployment rate for college graduates (Baum, Ma, et al., 2010).

The financial return on the investment in higher education is increasing (Baum, Ma, et al., 2010). In 2008, female college graduates earned 79% more than female high school graduates, and male college graduates earned 74% more than males with only a high school diploma; a decade earlier those differences in earnings were 60% and 54%, respectively (Baum, Ma, et al., 2010). Since then, the discrepancies in economic outcomes have continued. Taylor, Fry and Oates (2014) found that young college graduates outperform their peers who have only a high school education in employment, personal income and job satisfaction. The mean annual income of college graduates in 2012 dollars was \$45,500, compared to \$28,000 for those with only a

high school diploma (Taylor, et al., 2014). The unemployment rate was 3.8% for those with a bachelor's degree or higher, compared to 12.2% for those with only a high school diploma (Taylor, et al., 2014). The share of people living in poverty was 5.8% for those with a bachelor's degree or higher, compared to 21.8% for those with only a high school diploma (Taylor, et al., 2014). The authors conclude that the disparity in economic outcomes between college graduates and those with only a high school diploma "has never been greater in the modern era" (Taylor, et al., 2014, p.3).

College graduates also appear to be more likely than others to have job satisfaction, pension and health benefits (Taylor, et al., 2014); to have healthier lifestyles and lower health-care costs; to prepare their children for education; and to be engaged in their children's schooling (Baum, Ma, et al., 2010). Greenstone and Looney (2012) note that, in the wake of the recent Great Recession, and with published college tuition prices rising, there has been some debate in the news media and in policy circles about whether college is still worth it. They conclude, however, that even though published tuition rates have increased 50% over the past 30 years, the college degree brings lifetime earnings that have increased 75% over the same time (Greenstone & Looney, 2012).

An educated populace also appears to benefit society as a whole. Political science research documents a strong correlation between educational attainment and deeper civic engagement, increased tax revenue and lower spending on social programs (Baum, Ma, et al., 2010; Carroll, 2010; Dee, 2003). Dee (2003) presents an empirical analysis showing that increases in educational attainment have independent, causal effects on positive civic engagement and attitudes. He concludes that education has a dramatic impact on "the critical functions of a democratic society." Increased educational attainment results in increased tax

revenue, reduced costs for social welfare programs and reduced incarceration costs (Baum, Ma, et al., 2010; Carroll, 2010). Eight percent of high school graduates over age 25 lived in households receiving Food Stamps, compared to only 1% of people with a bachelor's degree (Baum, Ma, et al., 2010). Reduced spending on social safety-net programs and on incarceration are much lower for college graduates than for high school graduates, with estimates of lifetime savings ranging from \$32,600 for white women to \$108,700 for black men (Baum, Ma, et al., 2010).

An on-going attempt to democratize higher education began in the early 20th Century, but the first government intervention toward this end was the passage of the GI Bill in 1944 (Kimball, 2011). This and subsequent bills (the National Defense Education Act of 1958, the Higher Education Acts of 1965 and 1972, and the 1978 Middle Income Student Assistance Act) were attempts to broaden access (the ability to attend college) and equity (who could attend college) and thus extend the distribution of higher education's positive outcomes throughout society (Kimball, 2011).

Stratification in Higher Education

Nevertheless, research documents what appears to be a persistent gap in college attendance for students from lower socioeconomic backgrounds (Avery & Kane, 2004; Baum, Lapovsky, & Ma, 2010; Bergerson, 2009; Beyer, 2012; Dynarski, 2000; Kimball, 2011; Long, 2010; Winston, 1999). Gaps in college enrollment widened after 1980 (Avery & Kane, 2004), then narrowed somewhat between 1998 and 2008 (Baum, Ma, et al., 2010). The college enrollment rate for the lowest family-income quintile increased from 51% to 55% between 1998 and 2008, while the rate for middle income students declined from 63% to 61%, and the rate for the highest family income quintile increased from 79% to 80% (Baum, Ma, et al., 2010).

There is some evidence suggesting that higher education became more stratified due to the 1978 legislation, because it eliminated income requirements for student aid (Kimball, 2011). Kimball (2011) posits that the 1978 Middle Income Student Assistance Act, which broadened eligibility for federal tuition assistance and also removed college loan restrictions, provided a guaranteed funding base that allowed all schools to compete for all students. This favored the best schools and the wealthiest students, resulting in stratification in college choice (Kimball, 2011).

Government programs designed to improve college affordability for students from middle- and higher-income families have appeared to widen the socioeconomic gap in access to higher education (Dynarski, 2000; Kimball, 2011). Georgia's Hope Scholarship, for example, and the federal programs it inspired are not need-based, are offset by any aid that is need based, or they take the form of non-refundable tax credits, so that families too poor to pay taxes in the first place cannot qualify (Dynarski, 2000). Avery and Kane (2004) note that the enrollment gap persists while the earnings differentials accruing from a college education are rising dramatically.

Earning a higher education credential appears to be increasingly important for securing gainful employment in 21st Century America (Jacobson & Mokher, 2009). Students from low-income families are underrepresented throughout the education pipeline and the gap by family income increases at each educational milestone (Jacobson & Mokher, 2009). Low-income students face social and systematic barriers to educational attainment and these tend to perpetuate the cycle of poverty (Jacobson & Mokher, 2009; Perna, 2006). Only 60% of high school graduates from families earning less than \$33,000 a year attend college, compared to 90% from families earning more than \$88,000 -- and more than 40% of students in the top income quartile graduate, compared with only 6% from the bottom quartile (Jacobson & Mokher, 2009).

At highly selective colleges and universities, those that admit fewer than one-third of their applicants, three-quarters of the entering class comes from the highest socio-economic quartile (Haveman & Smeeding, 2006). Lower-income students, meanwhile, are more likely to attend types of institutions that have lower graduation rates. About 40% of students from families earning less than \$40,000 per year enrolled in public two-year colleges in 2007-2008, and about 8% enrolled in for-profit institutions. Of students from families with incomes of \$120,000 or higher, only 17% enrolled in public two-year colleges and only 1% attended for-profit schools. Overall six-year completion rates averaged 65% for four-year private not-for-profit colleges, 55% at four-year public colleges and 22% at for-profit institutions (Baum, Ma, et al., 2010).

Many top universities with large endowments, including Catholic universities that espouse Catholic social teaching's "option for the poor" (giving preference to the well-being of the poor and powerless), enroll relatively small percentages of Pell-grant eligible students (Beyer, 2012). Notre Dame University's endowment is more than \$5 billion, Beyer reports, yet only 8% of its students are from low-income families. Boston College has an endowment of \$1.5 billion, and Pell recipients account for 9% of its enrollment; Georgetown University has about \$1 billion, and 7% Pell recipients (Beyer, 2012). In contrast, Beyer found, Catholic universities with lower endowments enroll higher percentages of Pell recipients: Seton Hall (19%), Loyola of New Orleans (21%), and LaSalle University (25%).

Even students with equal qualifications are less likely to attend college if they are from a lower socioeconomic background (Carneval & Rose, 2003; Elliott & Lewis, 2013; Hahn & Price, 2008; Handel, 2014; Kane, 2004). Only 3% of freshmen enrolled in the nation's 146 most highly selective colleges are from families in the bottom quartile of income (Jacobson & Mokher, 2009).

And yet the nation's highest-ranked colleges and universities could enroll more moderate and low-income students without lowering their selection standards (Haveman & Smeeding, 2006).

College enrollments are rising but graduation rates are stagnant and the composition of these populations tends to perpetuate class differences (Haveman & Smeeding, 2006). For more than a quarter of a century, the earnings gap between those with a college degree and those without one has been widening (Jacobson & Mokher, 2009).

Equity and Access in the College Choice Process

Research on equity and access in higher education includes examinations of the higher education business model, the college choice process, and the impediments lower-income students face in attaining a college degree. A major impediment for low-income students is access to useable information about financial aid (Perna, 2006).

The Higher Education Business Model

Higher education has an unusual business model in which the quality of the product being sold depends in large part on the quality of the customers who buy it (Long, 2010; Winston, 1999). Most institutions of higher learning want to advance their reputations and prestige, and one way they can do that is to improve their product by attracting better students through the strategic use of merit aid (Winston, 1999).

Winston (1999) argued that students educate themselves and each other, so that the quality of the education a given student receives depends in no small part on the quality of that student's peers. Winston acknowledges that faculty matters, and facilities matter. But he insists that the quality of individual students at a school, and the composition of the student body as a group, has a major impact on educational quality.

In effect, therefore, two transactions take place when a student enrolls in a college: The student pays the college (tuition) for the education provided; and the college pays the student (financial aid or “tuition discount”) for the value that student brings to the quality of the institution (Winston, 1999). In other words, institutional scholarship money is awarded on the basis of student merit as well as on the basis of student need. The difference between tuition and all forms of aid is the student’s “net price.”

In the 2011-2012 academic year, the average price of attendance (tuition, fees, books, housing, food, transportation and personal expenses) among all undergraduates at private, non-profit four-year institutions was \$34,400 (Simone, Radwin, Wine, Siegel & Bryan, 2013). After controlling for inflation, that was \$3,900 higher than in 2007-2008 (Simone, et al., 2013). However, the average out-of-pocket net price (price of attendance minus all financial aid) among all undergraduate students at private, non-profit four-year institutions in 2011-2012 was \$15,000, an increase of only \$800 compared with 2007-2008 after controlling for inflation (Simone, et al., 2013). The difference is that, while institutions raised tuition, they also increased tuition discounts, so that while the average cost of attendance increased 12.7% during this period, the out-of-pocket net price increased only 5.6%. Of the \$185.1 billion in financial aid awarded to undergraduates nationwide in 2012-2013, colleges and universities provided \$44 billion, or about 24% (Baum & Payea, 2013). The federal government provided 71%, and the remaining 5% came from states and private sources. Baum and Payea (2013) found that undergraduates received an average of \$13,730 in aid, including \$7,190 in grants and \$4,900 in federal loans, with the balance in tax credits or work-study aid.

Baum and Payea (2013) found that total tuition discounts provided by institutions increased from \$22 billion in 2002-2003 to \$44 billion in 2012-2013 (all in 2012 dollars). Even

though tuition increases have been significantly off-set by financial aid increases, colleges are using less scholarship money for needy students and more for affluent students in order to meet quality goals for class composition (Baum, Lapovsky, et al., 2010; Haveman & Smeeding, 2006).

Baum, Lapovsky and others (2010) concluded that institutional grant aid does enable students to enroll in higher education institutions that they could not otherwise afford, but improving access is not the only goal. In fact, they wrote, colleges and universities use tuition discounts strategically to reduce the published price in order to fill seats that would otherwise be left empty, and especially in order to design and manage the composition of the entering class – to improve the school’s academic profile, to increase the prowess of athletic teams and to enhance their classes in other ways.

Some of the many forms of financial aid available to students include outside scholarships based on merit, not need; outside scholarships based on merit and need; state scholarships to in-state public schools only; state scholarships to in-state public or private schools; institutional merit scholarships; institutional need-based scholarships; institutional grants that are both merit and need based; work-study programs; and both subsidized and unsubsidized loans from the institution, from the government and from charitable organizations (Avery & Hoxby, 2004).

Avery and Hoxby (2004) wrote:

This fascinating array of scholarships, grants, loans and work study programs exists because many parties want to alter meritorious students’ college choices. The parties’ objectives are diverse – from a purely altruistic desire to relax constraints facing the needy to a college’s self-interested desire to enroll high-

aptitude students who raise its profile or improve education for other students on campus. (p. 240).

Over the past decade, college prices have increased, family incomes have not, and yet a significant portion of institutional aid in the form of tuition discounts is going to students who do not demonstrate financial need (Baum, Lapovsky, et al., 2010). It is worth noting, however, that higher discount rates at high-tuition schools are attributable to a larger discount meeting need at these institutions, compared to lower-priced institutions – because, in general, the higher-tuition schools can attract highly qualified students without awarding scholarships to those who can afford to pay (Baum, Lapovsky, et al., 2010).

The College Choice Process

Many factors complicate students' decisions about whether and where to apply for college admission. These factors include social capital, and the family's aspirations and influence; institutional marketing efforts; the range of differing attributes of colleges and universities, such as location, curriculum, tuition, and financial aid; and degree of access to pertinent information (Anctil, 2008; Avery & Hoxby, 2004; Bergerson, 2009; Perna, 2006).

The literature on the college choice process describes an array of models (Anctil, 2008). In essence, college choice seems to take place in three stages (Hossler & Gallagher, 1987) beginning around Grade 7: *the predispositional stage*, in which parental encouragement and socioeconomic status come into play in forming expectations on whether and where to attend college; *the search stage*, in which students consider academic requirements and occupational aspirations, and gather information about the attributes and financial requirements of different schools; and *the choice stage*, in which students create and narrow a set of schools to which they

can apply, based on academic requirements and affordability (Anctil, 2008; Cabrera & La Nasa, 2000; Hossler & Gallagher, 1987), and then decide.

Research shows that students' choices are constrained by variables beyond qualification and motivation (Anctil, 2008; Cabrera & LaNasa, 2000; Hahn & Price, 2008; Jacobson & Mokher, 2009; Kane, 2004; Perna, 2006). More than half of all college students enroll at an institution within 100 miles of home (Anctil, 2008) for example, and socioeconomic realities such as tuition and financial aid significantly limit and define students' choices (Cabrera & LaNasa, 2000). Meanwhile, although colleges and universities are engaged in a "trust economy" (that is, a transaction that requires them to communicate who they are and what they do for those who invest in them), they are simultaneously competing with each other, and attempting to influence the process by differentiating themselves in the marketplace -- often by focusing on attributes that are peripheral to academics, such as dining halls and climbing walls, hot tubs and free iPods (Anctil, 2008).

Students and their families recognize that their choice is potentially "life-framing" and could have major ramifications for their futures (Anctil, 2008). The decision is at once emotional (Will I be happy here? Will I make friends here?) and pragmatic (Will the investment I make at this school show returns in a career down the road?).

Research about the college choice process is complicated by issues of access, because access to college is not equitable (Avery & Hoxby, 2004; Avery & Kane, 2004; Baum, Ma, et al., 2010; Bergerson, 2009; Beyer, 2012; Dynarski, 2000; Jacobson & Mokher, 2009; Kane, 2004, Perna, 2006). Bergerson (2009) reviewed 20 years of literature on college choice. This work illuminates three major perspectives on the college choice process – *sociological*, with status attainment, race and ethnicity, family income, parent education and expectations, high school

quality and curriculum playing a role in choice; *psychological*, with perceptions about tuition costs and the availability of financial aid affecting decisions; and *economic*, with projected earnings after degree completion, and foregone earnings from a decision to attend college rather than enter the workforce coming into play. From all of these perspectives, students from lower socioeconomic backgrounds experience significantly greater constraints on whether and where to go to college than do students from higher-income families (Bergerson, 2009).

Bergerson (2009) found that the literature after 1990 reflects a steady trend in which authors studied more closely the experiences of students from different family backgrounds and income levels. This growing body of research examines the question of why higher education in the United States remains stubbornly stratified by social class, by income, race and ethnic background. The movement in the research, Bergerson found, is away from issues of choice and toward issues of equity and access. This research, refocusing on issues of access, examines constraints and impediments that tend to have a higher impact on lower-income students.

Impediments for Lower-income Students

Jacobson and Mokher (2009) identified four major impediments to increasing lower-income students' attainment of higher-education credentials.

- **Financial:** lack of funds needed to pay the direct costs (tuition, fees, books, living expenses, and transportation) and the indirect costs (foregone earnings at lower-paying jobs).
- **Experiential:** lack of academic preparation and work experience in high school.
- **Motivational:** lack of interest in entering different career fields.
- **Informational:** lack of information about the returns from attaining different credentials in preparation for work in different fields; lack of information about

the non-monetary characteristics of different fields; lack of information about the likelihood of completion of different degree programs based on performance level and skills; lack of information about the actual costs of completing different programs, and the types of aid and support available to make completing the course feasible.

Of these impediments, a lack of financial resources combined with a lack of information about financial aid result in “talent loss” (Plank & Jordan, 2001) even among motivated, qualified students of low-socioeconomic background. This dissertation examines the extent to which the Net Price Calculator required by the federal government in 2011 is being used by students from families of different economic backgrounds, and therefore serves or could serve as a tool to help close the information gap with respect to tuition costs and financial aid.

The information gap. In a review of literature spanning two decades Bergerson (2009) synthesized research findings that information shapes the college choice process, students from lower socioeconomic backgrounds experience constraints on their access to information, and limited access to information results in limited access to postsecondary opportunities. She found that sensitivity to cost and financial aid availability is greater among students of lower socioeconomic status, and that students whose parents lack resources and access to information may find their post-secondary options more limited than they would be if good information were readily available. All of these constraints are framed in the contextual layers (policy, higher education, school and community, and habitus) proposed in the conceptual model (Perna, 2006).

Historically, students and families have had relatively few tools to help them navigate the maze of public, private, for-profit, two-year, four-year and other postsecondary institutions, all of

which have differing admissions standards, costs, financial aid, curricula and credentials. Research demonstrates that families often do not understand their options (Long, 2010).

A 2010 poll by The College Board and Art & Science Group, LLC found that most students (59%) ruled out colleges because of their published full-tuition price alone, without ever exploring discount rates or financial aid (Cheng, 2011). Students from families of lower socioeconomic status are less likely to understand the college application process, and less likely to estimate accurately the cost of attendance at college than are students from higher-income families (Avery & Kane, 2004; Haveman & Smeeding, 2006; Plank & Jordan, 2001; Tierney & Venegas, 2009). Students in low-resource schools who need assistance and information the most have limited access to them (Bergerson, 2009; Jacobson & Mokher, 2009).

Long (2010) wrote that large numbers of students who are academically qualified for college nevertheless fail to attend any institution. These students and their families overestimate college costs and underestimate the benefits of a degree, so that their decision not to enroll is based on inaccurate information. Their conclusion is rational, Long argued, but it is based on a faulty premise. Long concluded that access to more accurate information could increase college enrollment.

Jacobson and Mokher (2009), in a study prepared for the Bill & Melinda Gates Foundation, examined the nation's educational pathways to high paying jobs that keep students out of poverty as adults; how these pathways differ for students at different performance levels; and the extent to which low-income students find and avail themselves of opportunities. They conducted a longitudinal study of a large cohort of Florida students from freshman year in high school in 1996 to post-secondary education and into the workforce. They concluded in part that development of career-oriented skills are best for lower-performing students, and that the gap in

college enrollment between students of equal qualifications but differing family incomes suggests that more should be done to make college affordable, and to provide counseling and information so that students understand their options.

Bergerson (2009) and Perna (2006) found that students from lower socio-economic backgrounds have lower levels of access to information resources, and therefore cannot participate in the college choice process in the same way that their middle- and upper-income peers can participate in it. That, Bergerson found, is why research and policy discussions are moving from questions of college choice to questions of access.

Limited information may hinder the ability of lower-income students to weigh the return on an investment in education, and to understand the financial aid opportunities that might make that investment possible (Bergerson, 2009). Lack of preparation in low-resource schools and lack of information about college-going resources, Bergerson suggested, keep the goal of enrolling in college beyond reach.

With the total cost of college education at the most expensive four-year private institutions now exceeding the average price of a home in the United States, families are seeking better and earlier information (Parrott & McWade, 2010). These authors argued:

Families are also questioning the arduous and mysterious process that they must go through with colleges in order to arrive at a bottom-line net price at the time of acceptance. The manner of arriving at a student's net price after taking into account all scholarships, grants, work study, and loans can be among the most frustrating aspects of the college admissions process. (p. 2)

Research-based recommendations (Avery & Kane, 2004; Long, 2010; Plank & Jordan, 2001; Tierney & Venegas, 2009) and Congressional testimony (Stone, 2011) advocated for improving

access to clearer consumer information about the costs and benefits of higher education and have looked to the federally mandated Net Price Calculator as a new day in consumer transparency.

Plank and Jordan (2001) conducted a multivariate study of “talent loss” based on data from the National Educational Longitudinal Study of 1988, tracking a sample of 25,000 eighth graders at more than 1,000 schools through 1994. They concluded, in part, that if low-income students were provided the same quantity and quality of information and guidance that their more affluent peers receive, and that if low-income students received more encouragement to prepare for college academically, then the nation would see a significant increase in higher-education attainment by lower-income students and an overall reduction in talent loss.

The Net Price Calculator

Before the Net Price Calculator requirement, the vast majority of students and families could find published tuition prices, but had no clear idea of what college would actually cost until many of their decisions about where to apply were already made, and they were accepted and offered scholarships (Cheng, 2011). Without clear information early in the college choice process, up to 59% of students ruled out colleges based on published full-tuition price without considering financial aid (Student Poll, 2010). The Net Price Calculator gives students and families early, customized information about their net price -- the difference between a school’s published tuition and the amount of financial aid a student is able to secure from all available sources.

Published tuitions of colleges and universities have risen dramatically, but so has financial aid (Baum, Lapovsky, et al., 2010). The actual cost of college has risen more slowly than the published full-tuition price. After adjusting for inflation, in fact, the average net price at the nation’s public institutions was lower in 2009-2010 than in 1999-2000 (Baum, Lapovsky, et

al., 2010). Institutional aid is more generous at private not-for-profit colleges and universities, so that “for all but the most affluent students, net price is actually higher at for-profit colleges than at private not-for profit colleges, which have higher published prices” (Baum, Lapovsky, et al., 2010).

In the past, students have had to complete the Free Application for Federal Student Aid (FAFSA) form, receive an Expected Family Contribution (EFC) estimate, and receive an award letter from a school in order to learn how much financial aid was available to them (Avery & Kane, 2004). That process will still take place, with one key exception: By using the Net Price Calculator, students and families can get an estimate of what a college will cost before they even apply to it (Cheng, 2011).

In order to empower students and their families with actionable information by giving them an earlier estimate of available aid (Long, 2010) The Education Opportunity Act of 2008 required colleges and universities to post a Net Price Calculator on their websites beginning in October, 2011. The law defines estimated net price as the difference between average total cost (tuition and fees, room and board, books and supplies, transportation) and need- and merit-based grant aid awards. At a minimum, the Net Price Calculator must require users to input family size, family income, student’s dependency status – and they must generate estimated total cost of attendance, tuition and fees, room and board, books and supplies, other expenses including transportation, total estimated grant aid, estimated net price, caveats and disclaimers (Stone, 2011).

The rationale is to enable prospective students to find out more easily, and much sooner, how much financial aid they might expect, and what they would actually pay to go to any college (Stone, 2011). Within limits, the Net Price Calculator enables students and their families to

compare net price from one college to another, and also to compare published tuition with actual cost (Piccioli, 2012).

The government does not specify where on an institution's website the Net Price Calculator must be located, but the U.S. Department of Education urges institutions to make them "easy to find by posting them prominently ... within no more than three clicks from the home page" (U.S. Department of Education, 2014). The government does not have an approval process but states that institutions themselves are responsible for determining that they are in compliance with the requirements. (U.S. Department of Education, 2014).

As colleges prepared to meet this new mandate, they had to decide whether to use a free template offered by the federal government; work with a vendor specializing in the software; or create their own on-line calculator in-house (Higher Education Opportunity Act, 2008). Institutions also had to decide how to balance accuracy with ease of use; calculators that require more data are more accurate, but more difficult to use (Supiano, 2010). In addition, schools had to decide where on the website to locate the Net Price Calculator – and whether to market it as a useful enrollment management tool, or locate it deep inside their website, and check it off as another compliance item met. As the mandate approached, colleges wondered how many families would use the Net Price Calculator, how these users would be represented in terms of socioeconomic status, and at what point in the college-choice process students and families would estimate college cost (Supiano, 2010).

As students and their families access this information and make judgments and comparisons among institutions, higher education administrators and boards of trustees might need to engage in deeper discussions about how they set tuition and allocate financial aid (Lapovsky, 2011). They might begin to discuss questions, argued Lapovsky (2011), including:

- What is our discount rate (percent by which published tuition is reduced by institutional aid) by family socioeconomic status? What percent of each entering class gets what percent of available aid, by family income?
- What is our discount rate by student academic achievement, leadership qualities, artistic talent, etc., (commonly referred to as the “reader rating” that indicates how desirable a student is to our institution)?
- What is the distribution of each entering class by discount rate? What percent pays full freight, what percent gets a free ride, and what percent falls into other discount rate quartiles or quintiles?

Colleges and universities may learn that the Net Price Calculator is not only a compliance issue, but a strategic communications issue as well (Fallon, 2011). Kathy Dawley, former president of Maguire Associates, an enrollment management consulting firm that models financial aid, enrollment and net revenue yields for client institutions, said, “The very fact that net price estimates will be available before prospective students show their hands as applicants will really change the game” (Fallon, 2011). “Colleges will start with cost details and will have to communicate value – including graduation rates, employment outcomes and professional school placements.”

With the help of the Net Price Calculator, low-income students may discover that it would actually cost them less to enroll at an “expensive” four-year private university than at their local community college (Lapovsky, 2011). This could increase college going among students from lower socioeconomic backgrounds. Or, the primary users could be students from higher-income families who could afford to pay more for college, but could use the information to strengthen their hand in negotiations with institutions for more merit aid (Fallon, 2011).

A poll of high school students taken three months after the Net Price Calculator requirement went into effect found that 35% of students had already used an on-line calculator to determine the net price of a college (Student Poll, 2012). This was up from nine percent in the early phases of the search and 16% in the later phase found in a 2010 poll taken before Net Price Calculators were universally required (Student Poll, 2010). The 2012 poll found that more than half of students and families were still choosing not to apply to colleges based on published tuition price alone, without taking into consideration what financial aid they might receive, even though an overwhelming majority were planning to apply for financial aid. The poll found that students and families were more likely to seek information about net price from the Free Application for Federal Student Aid (FAFSA) website, individual college websites, and college brochures than from the new Net Price Calculator.

The lower use of the Net Price Calculator could be attributed in part to the fact that it was new, and difficult to find on many college websites (Cheng, Asher, Abernathy, Cochrane, & Thompson, 2012). In this report for the Institute for College Access & Success in October, 2012 – one year after the Net Price Calculator requirement went into effect – the authors examined the location of Net Price Calculators on 50 randomly selected college and university websites and found that nearly 25% of them were hard to find because the links to their Net Price Calculators were not posted in the financial aid sections of their websites. Ten percent of the institutions called the Net Price Calculator by another name, such as “Education Cost Calculator” or “Tuition Calculator.” And the study found that a third of the schools provided links to the U.S. Department of Education that would not take students and families directly to their Net Price Calculators. The study did not report on actual usage rates, but it recommended that colleges and

universities should make their Net Price Calculators visually prominent and easy to find. These recent findings further support the need for the present study.

Conceptual Model

Perna (2006) proposes a conceptual model for understanding the relationship between information about tuition and financial aid and student behavior in the college choice process. Her model provides a framework for examining why and how the availability of information, and the actual acquisition and use of that information, differs across demographic groups of prospective students and their families. The model connects the related research literature, supports the need for the present study, and illuminates a discussion of the results.

Based on research showing that an information gap exists across demographic groups, constrains underrepresented students in the college choice process, and works against equity and access in higher education attainment (Grodsky & Jones, 2007; Immerwahr, 2003), the author proposed four “nested layers of context” as lenses through which to view the information gap (Perna, 2006). The lenses are:

- The social, economic and policy context.
- The higher education context.
- The school and community context.
- The habitus context.

Research shows that students and their families are poorly informed about college costs and financial aid despite an abundance of available information, and that acquisition and use of the available information differs across ethnic and socioeconomic groups (Perna, 2006). The research finds lower levels of understanding among African American and Latino students (Grodsky & Jones, 2004; Immerwahr, 2003). Research further suggests that a lack of information

about tuition and financial aid may contribute to the gap in higher education attainment among lower-income students (Jacobson & Mokher, 2009; McDonough & Calderone, 2006). Perna (2006) proposes her conceptual model as a way to examine these variations across groups. The model assumes that the four contextual layers shape student decisions about college choice.

The Social, Economic and Policy Context

Perna (2006) argues that societal expectations have shifted the burden of paying for college over the past several decades so that families are paying proportionately more and government is paying proportionately less. Meanwhile, news media reports stress escalating college tuition costs while neglecting to provide information about the growth in financial aid that offsets these tuition increases. For these reasons, according to Perna (2006) and the College Board (Student Poll, 2010; Student Poll, 2012), low-income families might be more likely to assume that college is beyond their economic reach. The model suggests that the policy context may contribute to the differences in access to available information across ethnic and income groups because the financial aid system it has created is highly complex, difficult to understand, and leaves significant levels of financial need unmet (Perna, 2006). In addition, the current policy context tends to encourage high levels of student debt, especially for low-income students. Perna (2006) acknowledges that states offering merit-aid may increase awareness about tuition and financial aid within this policy context, but concludes that further research is needed to examine the relationships among better information about financial aid, the financial aid itself, and increased college enrollment.

The Higher Education Context

Colleges and universities play a key role, perhaps the leading role, in disseminating information about tuition and financial aid to prospective students (Perna, 2006). Individual

institutions may be active or passive in this role, and the author notes that little research has been done in this area. However, she argues that institutions may convey information passively within their own regions, by virtue of geographic proximity and community awareness. Institutions may also actively market information about tuition and financial aid in connection with their enrollment management and recruitment efforts. But even these efforts are usually targeted, in reaction to requests for information initiated by students and their families. Lower-income students are less likely to apply for admission (Cabrera & LaNasa, 2000), and Perna asserts that the passive and even the reactive ways in which colleges and universities convey information about tuition and financial aid may perpetuate or even contribute to the information gap across groups.

It is important to note that Perna (2006) proposed her conceptual model before the federal government required all colleges and universities to post a Net Price Calculator on their websites beginning in 2011. The higher education context has changed, therefore, in that when the model was proposed, students learned about their eligibility for financial aid at a given institution only after applying and being admitted. Today, students may get an estimate of their financial aid at any institution anonymously, without ever actually applying to the school. However, the model's distinction between active and passive dissemination of information about tuition and financial aid is still very much a part of the higher education context, as evidenced by the variance across institutions in the location of the Net Price Calculator. Indeed, how schools actively or passively deploy the Net Price Calculator on their web sites (that is, with high visibility or low visibility), and whether that might have an impact on the dissemination of information about tuition and financial aid across income groups, is the focus of this study.

The School and Community Context

High schools tend to perpetuate differences across groups with respect to access to information about college tuition and financial aid (McDonough & Calderone, 2006; Perna, 2006; Tierney & Venegas, 2009). Resources that promote college-going behavior, including access to rigorous curriculum, exposure to college recruiters, encouragement of teachers, and participation in college out-reach programs, are awarded disproportionately to high-achieving students, who in turn tend to be from higher-income families (Perna & Titus, 2005). Meanwhile, low-income students and their parents are more dependent on high school counselors and teachers for information about college (Cabrera & LaNasa, 2001), even though counseling is limited because of high caseloads and competing demands (Tierney & Venegas, 2006) and teachers often have lower expectations for underrepresented populations (Immerwahr, 2003). Lower-income high school students, therefore, are dependent for information on their parents, who don't have that information and who may in fact be counting on their children to get it (Tomas Rivera Policy Institute, 2004).

The Habitus Context

Habitus, or the lifestyle, cultural values, expectations and predispositions of social groups absorbed through everyday interactions, forms another basis for how individuals acquire and make meaning of information about college tuition and financial aid (McDonough & Calderone, 2006). Lower-income students may not seek out or engage with available information about financial aid if their habitus includes assumptions about published tuition prices that make the very idea of college seem unrealistic in the first place (Perna, 2006). In addition, the share of college costs borne by the family has shifted from parents to students (Hearn, 2001, Perna, 2006). Habitus may also impact a student's willingness to take out student loans, which are a significant

part of the equation for many students (Perna, 2006). The author argues that information about college affordability may not be available in a form that is useable by students and families from low-income and historically underrepresented groups.

In summary, the conceptual model (Perna, 2006) describes a college choice process that is dependent upon access to information about tuition and financial aid. An information gap seems to exist across income groups because it is embedded in and perpetuated by the contextual layers of policy, higher education, high school and habitus. Perna (2006) argues that making information available is not enough. Instead, it must also be accessible, relevant and useable across groups. Guided by the framework of this conceptual model, this dissertation begins to examine whether the Net Price Calculator is a step in that direction.

Summary

This literature review appears to establish that higher education attainment is important to the success of individuals and a significant benefit to society. But access to higher education is not equitable, and talent is lost, because lower-income students face a set of impediments to higher education attainment. One of these impediments is a lack of information about financial aid and affordability. To improve consumer transparency about college costs, the federal government required all colleges and universities to place a Net Price Calculator on their web sites beginning in 2011. Because the Net Price Calculator is new, there is an open field for research about whether it will be effective in closing the information-gap impediment faced by lower-income students and, ultimately, whether it will help improve equity and access in higher education. The present study examines Net Price Calculator usage by website visibility and family income among more than 10,000 users at six similar, private four-year colleges and universities.

CHAPTER 3:

METHODOLOGY

This study grows out of research in the field of higher education equity across income groups, specifically equity in access to useable information about college tuition and financial aid. The study examines the first enrollment cycle of data captured from a total of more than 10,000 users of Net Price Calculators at six private, not-for-profit, four-year colleges and universities to examine the use of this new tool by family income level and by the visibility of its location on institutional websites. The research questions guiding this study are:

1. Does website visibility impact use of the Net Price Calculator?
2. Does family income impact use of the Net Price Calculator?
3. Is there a relationship between website visibility and family income in use of the Net Price Calculator?

Study Design

This study utilizes a quasi-experimental, post-test-only design with non-equivalent groups. Although the subjects are not randomly-assigned to control and treatment groups, the comparison is appropriate because the units and comparison groups are very similar with respect to other key variables not being tested, in order to strengthen the study against possible selection threat to internal validity (Shadish, Cook, & Campbell, 2002).

Data Selection and Context of Study

To investigate the research questions, a total of six four-year, private, not-for-profit institutions of higher learning – geographically diverse, but all of similar size, selectivity and student demographics, and all using a version of the Net Price Calculator from the same commercial vendor, Student Aid Services -- were divided into two groups of three institutions

each. In one group, the three schools have highly visible Net Price Calculators. In the other group, the three schools have low-visibility Net Price Calculators.

Levels of Visibility

“High Visibility” is defined for purposes of this study as having the hyperlinked words “Net Price Calculator” on the home page or one click from the home page on the Admissions landing page. (At some institutions, the Admissions landing page is, in effect, the home page for prospective students). The other group has lower-visibility Net Price Calculators. “Lower Visibility” is defined for purposes of this study as having the hyperlinked words “Net Price Calculator” at least two clicks away from the home page.

Institutions numbered 1, 2 and 3 comprise the High Visibility Net Price Calculator group. The navigation for each of these websites to the hyperlinked words “Net Price Calculator” is as follows:

- School 1: Net Price Calculator hyperlink button appears on the home page (zero clicks).
- School 2: On the home page, mouse over Admissions, see a fly-out hyperlink to the Net Price Calculator on the home page (zero clicks).
- School 3: Home > admissions home, see a promotional image and the hyperlink to the Net Price Calculator (one click).

Institutions numbered 4, 5 and 6 comprise the Low Visibility Net Price Calculator group. The breadcrumb navigation to the hyperlinked words “Net Price Calculator” for each of these websites is as follows:

- School 4: Home > admissions > undergraduate admissions > net price calculator (two clicks).

- School 5: Home > admissions > financial aid > scholarships and grants > freshmen > scholarship calculator > net price calculator (five clicks).
- School 6: Home > undergraduate studies > tuition and aid > financial aid > net price calculator (three clicks).

Levels of Family Income

For purposes of this study, family income is defined as parents' adjusted gross income plus student's adjusted gross income as reported on the Net Price Calculator. Family income is divided into three levels, Low, Medium and High. The cut points for these levels are derived by combining household income quintiles as reported by the U.S. Census Bureau (Household income quintile upper limits, 2010) as follows:

- Low income: < \$39,212
- Medium income: \$39,212 - \$99,891.
- High income: > \$99,891.

It should be noted that the United States ranks 42nd in the world in the degree of inequality in the distribution of family income (CIA, 2012), with a GINI Index of 45.0. According to this index, perfect inequality is 100, with one person having all the money, and perfect equality is 0, with everybody having the same amount of money (CIA, 2012). A high degree of inequality in income distribution is important to note in this study because using income distribution by population quintiles to determine low, medium and high income results in category cut points that might be considered lower than the functional reality in America. For example, a family of four earning \$42,000 would fall in the Medium income group in this study, but would qualify for the U.S. Department of Agriculture's school Reduced Price Lunch program (Tribiano, 2012). Nevertheless, these cut points based on population quintiles are

defensible, given the fact that even The U.S. Congress cannot find any official or standard definition of the phrase “middle income” in America (Cashell, 2007).

Data Collection

Data from the Net Price Calculator vendor, Student Aid Services, (a provider of Net Price Calculator technologies and services to colleges and universities) was obtained on all prospective students who completed the Net Price Calculator at the six schools. (No data can be traced by the researcher to any individual, and the researcher signed a confidentiality agreement with Student Aid Services to protect the identity of the schools.) The time period under study is the Net Price Calculator’s federally required start date in October, 2011, through and including the college admissions decision month of May, 2012. Net Price Calculator usage was compared between the High Visibility and Low Visibility groups, by income level. The number of schools participating is too small to permit statistical matching procedures to strengthen internal validity, but individual and group pre-existing differences were mitigated in the selection process using data from the Integrated Postsecondary Education Data System (U.S. Department of Education, National Center for Education Statistics, 2011).

First, all six schools in the study were compared with respect to key variables not under study, namely: undergraduate enrollment; average net price of tuition for students receiving grant or scholarship aid; percent of full-time first-time students receiving any financial aid; percent of full-time first-time undergraduates receiving Pell Grants; and average composite 25th percentile ACT score of admitted students. The results are shown in Table 1.

Table 1

Institution by attribute

Institution	Enrollment	Avg. Net Price	% Fin Aid	% Pell	Avg. ACT
1.	2,602	\$21,422	100	27	22
2.	2,962	\$16,544	100	47	20
3.	3,390	\$24,444	99	19	22
4.	2,590	\$13,014	97	40	N/A
5.	1,562	\$29,488	96	32	20
6.	2,755	\$29,849	92	22	21

Next, descriptive statistics for the variables were derived for the two comparison groups. Group 1 (institutions 1, 2 and 3) is the High Visibility Net Price Calculator group. Group 2 (institutions 4, 5 and 6) is the Low Visibility Net Price Calculator group. The results are shown in Table 2.

Table 2

Group by attribute.

Group	Enrollment	Avg. Net Price	% Fin Aid	% Pell	Avg. ACT*
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
1. (1,2,3)	2,984 (394.49)	\$20,761 (2,401)	99 (.58)	31 (14.42)	21 (1.15)
2. (4,5,6)	2,302 (646.43)	\$23,334 (10,566)	95 (2.65)	31 (9.02)	20 (.71)
Total	2,643 (607.1)	\$22,048 (6,996.57)	97 (3.08)	31 (10.76)	21 (1)

*One school in group 2 does not require the ACT.

All six participant schools have undergraduate enrollment under 4,000; have an average net price for students receiving aid of under \$30,000; offer financial aid to 90-100% of entering students; enroll 22-47% Pell-eligible students; and have a 25th percentile average ACT score of 20-22 (one school does not require the ACT). When the six schools are assigned to two groups of three schools each, the mean differences are even smaller, with mean enrollments under 3,000 in each group; mean net price under \$25,000; 95-99% of admits receiving financial aid; 31% of students receiving Pell Grants; and 25th percentile ACT average at 20-21. In the universe of private, not-for-profit, four year institutions, these schools and groups are very similar with respect to these other variables.

Statistical Analysis

This study was designed to determine whether website visibility impacts use of the Net Price Calculator, whether family income impacts use of the Net Price Calculator, and whether there is a significant relationship between website visibility and family income level in use of the Net Price Calculator. In this study we are determining the relationship between two categorical variables, Net Price Calculator website visibility and family income. A 2x3 contingency table was used, because we have two levels of one variable, visibility (high and low) and three levels of the second variable, income (low, medium and high). The variables are arranged in a contingency table, or crosstab, so that one variable is distributed across each level of the other variable. In this case, levels of family income are in the rows and levels of website visibility are in the columns.

The appropriate test of the data is the chi-square analysis (Howell, 2010; Tabachnick & Fidell, 2007). The chi-square analysis generates expected frequencies for each cell in the contingency table, and the observed frequencies are tested against those expected frequencies

(Tabachnick & Fidell, 2007). This study uses the one-variable chi-square test for goodness of fit and the two-variable chi-square test of independence.

The one-variable chi-square test for goodness of fit is used to determine whether the observed frequencies of one variable are significantly different from the expected frequencies, beyond what would be expected by chance (Howell, 2010; Tabachnick & Fidell, 2007). In this study, we are using the chi-square test of goodness of fit to examine observed vs. expected use of the Net Price Calculator by website visibility, in order to address the first research question. We are also using the chi square test for goodness of fit to examine observed versus expected frequencies of Net Price Calculator use by income level, in order to answer the second research question. In each case, the chi-square goodness-of-fit test will determine whether differences between observed and expected frequencies of use of the Net Price Calculator in each variable are significantly greater than would be expected by chance.

The two-variable Pearson's Chi-Squared test of independence is used to examine whether there is a relationship, or interaction, between the two categorical variables (Howell, 2010; Tabachnick & Fidell, 2007). In this study, the variables are income and website visibility. We are examining whether use of the Net Price Calculator by users of different income levels is contingent upon whether it is located with high or low visibility on the institutions' websites. The null hypothesis being tested in this case is that family income is independent of website visibility with respect to Net Price Calculator use. If the observed frequencies are close to the expected frequencies, then the null hypothesis is retained and we conclude that the variables are independent. If, however, the observed frequencies differ sufficiently from the expected frequencies, the null hypothesis is rejected and we conclude that the variables are not independent and that there is a relationship (Howell, 2010; Tabachnick & Fidell, 2007).

CHAPTER 4:

RESULTS

The research questions in the present study arise from research suggesting that an information-gap impediment contributes to inequity in access to higher education for lower-income students, and from the federal government's Net Price Calculator requirement designed to improve consumer transparency and help close that gap. The research questions are:

1. Does website visibility impact use of the Net Price Calculator?
2. Does family income impact use of the Net Price Calculator?
3. Is there a relationship between website visibility and family income in use of the Net Price Calculator?

In this study, a total of 10,726 instances of Net Price Calculator use at six four-year, private, not-for-profit universities were studied to answer these questions.

Impact of website visibility

The first research question asks if website visibility impacts use of the Net Price Calculator. To determine the differences in use of the Net Price Calculator, the total number of users at the six schools during the period under study was categorized by visibility group (low and high). The overwhelming majority of Net Price Calculator completions took place on websites where the tool was located with high visibility. Only about 11% of the 10,726 people completed the Net Price Calculator on websites where the tool was located with low visibility. A chi-square test of goodness of fit determined that the differences between the observed and expected frequencies of Net Price Calculator use, with equal expected frequencies assumed for each level of visibility, is significant, $\chi^2 (1) = 6,572.14, p < .001$. Table 3 shows the frequency of Net Price Calculator use at the two levels of website visibility.

Table 3

Net Price Calculator use by website visibility

Level of Visibility	<i>n</i>	%
Low Visibility	1165	10.9
High Visibility	9561	89.1
Total	10726	100.0

Impact of Family Income

The second research question asks whether family income impacts use of the Net Price Calculator. The data were used to determine whether Net Price Calculator use is equally distributed among levels of family income. The levels of family income were determined by U.S. population quintiles, with the bottom two quintiles comprising the low-income group, the second two quintiles comprising the medium-income group and the top quintile comprising the high-income group. The expected frequency of Net Price Calculator use by income group, therefore, would be 40% low-income, 40% medium income and 20% high income. However, about half of the 10,726 completers of the Net Price Calculator were in the low-income group, that is, from families with an adjusted gross income of less than \$39,212 a year. About a quarter was from medium-income families (\$39,212-\$99,891), and another quarter was from the higher-income families (more than \$99,891). A chi-square test of goodness of fit determined that the differences between the observed and expected frequencies of Net Price Calculator use within income levels is significant, $\chi^2(2) = 1,061.43, p < .001$. Table 4 shows Net Price calculator use at the three levels of family income.

Table 4

Net Price Calculator use by family income level

Income level	<i>n</i>	%
Low	5,425	50.6
Medium	2,638	24.6
High	2,663	24.8
Total	10,726	100.0

Relationship of Website Visibility and Family Income

The third research question asks whether there is a relationship, or interaction, between website visibility and family income in use of the Net Price Calculator. In other words, are users from different income levels more or less likely to use the Net Price Calculator based on whether it is located with high website visibility or low website visibility? A chi-square test of independence was performed to examine the relationship between website visibility and income level. The relationship is significant, $\chi^2(2) = 30.26, p < .001$. Website visibility apparently is not independent of income level. Chi-square results are subject to inflation when sample sizes are large (Cohen, 1992). The effect size for this finding, Cramer's V, was low, .053 (Cohen, 1992), meaning that the strength of the association between the variables is trivial.

Of all the students who used the Net Price Calculators at these six universities, 50.6% were low-income students, 24.6% were medium-income students, and 24.8% were high income students. In other words, wherever the Net Price Calculator was located, low-income students appeared to be more likely to find it and to use it than medium- and high-income students.

Table 5 shows the cross-tabulation of the data with frequencies of Net Price Calculator use by website visibility and income level.

Table 5

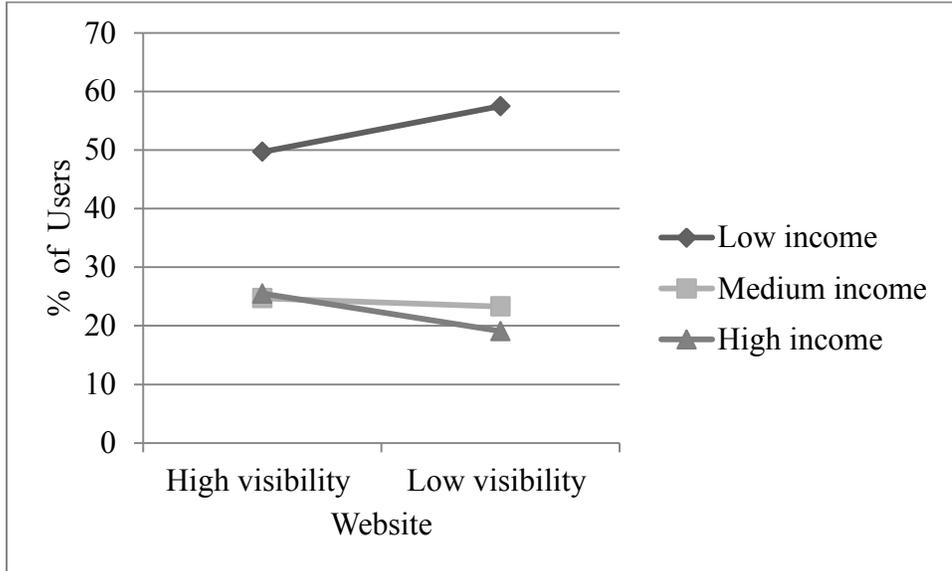
Net Price Calculator Use by Income Level and Website Visibility

Income	Website Visibility		Total(%)
	High(%)	Low(%)	
Low	4,755(49.7)	670(57.5)	5,425(50.6)
Medium	2,366(24.7)	272(23.3)	2,638 (24.6)
High	2,440(25.5)	223(19.1)	2,663 (24.8)
Total	9,561(89.1)	1,165(10.9)	10,726 (100.0)

Low-income students accounted for 49.7% of all those who used the Net Price Calculator when it was highly visible on the website (that is, when a hyperlink to the calculator appeared on the home page or within one click of the home page). Only 24.7% of these users were medium-income, and only 25.5% were high-income students.

The difference in Net Price Calculator use by income level appeared to be even greater on the low visibility websites, where a hyperlink to the tool was located two or more clicks from the home page. For these hard-to-find and comparatively lightly used Net Price Calculators, 57.5% of the users were low-income students while 23.3% were medium-income students and 19.1% were high-income students. Figure 1 illustrates the difference in usage rates by income groups at the high- and low-visibility Net Price Calculators.

Figure 1. Net Price Calculator Use



The evidence suggests that, assuming equal overall internet traffic to the institutions' websites, high-visibility Net Price Calculators have more users. In fact, the results of this analysis show that almost 90% of prospective college students who completed the Net Price Calculator did so at institutions that gave it a highly visible place on their websites. The evidence suggests that low-income users were more likely than expected to use the Net Price Calculator wherever it was located, that high-income users were more likely than expected to use it in the high-visibility locations but less likely than expected to use it in the low-visibility locations, and that medium-income users were less likely than expected to use it wherever it was located.

CHAPTER 5:

INTERPRETATIONS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to examine usage of the Net Price Calculator in an effort to understand whether this new, federally required Internet tool might help close the gap in access to useable information about tuition and financial aid, which a search of the literature has identified as one key impediment to higher education access for low-income students. Three research questions guided this study:

1. Does high website visibility impact use of the Net Price Calculator?
2. Does family income impact use of the Net Price Calculator?
3. Is there an interaction between website visibility and family income in use of the Net Price Calculator?

Data for the study were collected on a confidential basis from Student Aid Services, a commercial provider of Net Price Calculators, and include more than 10,000 users who completed the calculation at six similar four-year, private, non-profit higher-education institutions. A 2x3 contingency table was used to analyze the data. One variable was Net Price Calculator website visibility with two levels, high visibility and low visibility. The other variable was family income with three levels, low, middle and high income. A chi square analysis was used to analyze the data.

This chapter discusses the findings in the context of past research and the conceptual model (Perna, 2006), presents interpretations and conclusions, suggests implications for theory and makes recommendations for practice. Finally, it identifies opportunities for future research.

Summary of Findings

Research on the college choice process is often focused on issues of equity and access. We understand from the research that higher education attainment offers benefits to individuals and society (Baum & Payea, 2013; Carroll, 2010; Dee, 2003; Haveman & Smeeding, 2006; Jacobson & Mokher, 2009; Long, 2010). Many researchers believe that access to higher education is inequitable in the United States today, and that students from low-income families are increasingly underrepresented at each milepost throughout the education pipeline (Avery & Kane, 2004; Baum, Ma, et al., 2010; Haveman & Smeeding, 2006; Jacobson & Mokher, 2009). Several studies suggest that even students with equal academic qualifications are less likely to attend college if they come from families in poverty circumstances (Carnevale & Rose, 2003; Elliott & Lewis, 2013; Hahn & Price, 2008; Handel, 2014; Kane, 2004). And many believe that addressing this educational inequity is vital to reducing economic inequality and the transmission of poverty from generation to generation (Jacobson & Mokher, 2009).

One of the major impediments to increasing college-going rates for lower-income families has been their assumption of unaffordability coupled with the difficulty in accessing clear, understandable information about available financial aid (Jacobson & Mokher, 2009; Perna, 2006; Sturtevant, 2010). The federal government's requirement that all colleges and universities post a Net Price Calculator on their websites by October 2011 (Higher Education Opportunity Act, 2008) was widely anticipated in the field as a potentially effective way to help close this information gap with universally available consumer information that clearly explains individualized college costs (Cheng, 2011; Fallon, 2011; Lapovsky, 2011; Parrott & McWade, 2010; Supiano, 2010).

The present study, therefore, set out to examine actual Net Price Calculator usage data in order to determine:

- The extent to which prominent website placement affects the numbers of students who find and use this new tool to gain information about affordability and access to college;
- The degree to which prospective college students of differing income levels are finding and using this new tool;
- Whether website placement has a different impact on low-income student use as opposed to middle- or high-income student use.

The results of this study of Net Price Calculator use are based only on this set of data from six similar four-year private non-profit universities and may not be generalizable. But the results suggest evidence that should lead to replication and further research.

Use by Website Visibility

It seems reasonable to assume that a prominent link on a website will be used more frequently than a link that is difficult to find, but the results of this study show that the difference may be significant. Of 10,726 users of Net Price Calculators at the six schools in the study, 9,561 of them, almost 90%, did so at the three schools whose Net Price Calculator link appeared with high visibility and prominence. At the three schools whose Net Price Calculators were two or more clicks away from the home page, only 1,165 students, or 10.9% of the total, found and used the Net Price Calculator tool. Although the results may not be generalizable, they suggest the possibility that prospective college students may be about nine times more likely to find and use the Net Price Calculator if it is located with high visibility on a school's website.

Use by Income Level

Research shows that one reason for inequity across income groups in higher-education attainment rates is that lower-income students have difficulty accessing and using information about college tuition and financial aid (Jacobson & Mokher, 2009; Perna, 2006). This study suggests the possibility that low-income students may desire this information, and that they used the Net Price Calculator to a greater extent than their middle- and high-income peers. In fact, the data show that low-income students (those from families earning less than \$39,212 per year) are about twice as likely to find and use the Net Price Calculator as are middle-income students (\$39,212 - \$99,891) or high-income students (more than \$99,891) -- and this appears to be true regardless of where the tool is located on the website. Overall, 50.6% of students who used the Net Price Calculator at the six schools were from the low-income group. The middle-income group accounted for 24.6% of users, and the high-income group made up 24.8%. Within the high-visibility Net Price Calculators, 49.7% of the users were low-income students, compared with 24.7% medium income and 25.5% high-income students. Within the low-visibility Net Price Calculators, 57.5% of those users were low-income students compared with 23.3% medium-income students and 19.1% high-income students. In other words, the numbers suggest that low-income students were more determined than the others to find and use the Net Price Calculator even when it was more difficult to locate.

Interpretations and Conclusions

Within the context of this study, Net Price Calculators located prominently (with high visibility) on institutional websites were more likely to be used than those more difficult to find. In fact, the high-visibility Net Price Calculators had almost nine times more usage than those which were located with low visibility.

The findings seem to suggest that low-income students were more likely to use the Net Price Calculator than were middle- and high-income students wherever it was located, and that the difference among income groups was slightly greater when the Net Price Calculator was located with low visibility. The results suggest that the low-income students were finding and using the Net Price Calculator to access information about tuition and financial aid more frequently than expected.

Implications for Theory

These findings may have implications for research and theory focused on the information gap and low-income students' acquisition of information about tuition and financial-aid. Perna (2006) proposed a conceptual model that examined the acquisition and use of available information about tuition and financial aid in the social, economic and policy context, in the higher education context, in the school and community context, and in the context of habitus. The social, economic and policy context identified a public perception that tuition costs are increasing rapidly, without a concurrent public perception that financial aid is growing even more rapidly. In addition, the social and policy context identified a financial aid system that is complicated and difficult to understand, especially among lower-income students. As a result, Perna (2006) suggested that low-income families may be more likely to assume that college is beyond their economic reach. The advent of the Net Price Calculator in 2011 represents a significant change in the policy context, and the results of this study suggest that the Net Price Calculator might be one way to narrow the information gap across income groups.

In the higher education context of the conceptual model, Perna (2006) argued that institutions play a leading role in information about college choice and financial aid, and that they convey information both passively and actively. Information is often conveyed passively

through community awareness and reputation within geographic proximity, and it is generally conveyed actively through targeted enrollment management and recruitment communications and marketing (Perna, 2006). Since lower-income students appear to be less likely to apply to college (Cabrera & LaNasa, 2000), they may be less likely to be recipients of targeted marketing information about tuition, financial aid and college enrollment. For this reason, Perna (2006) suggested that institutions might perpetuate or even contribute to the information gap across income groups.

The Net Price Calculator has implications for the higher education context, because students can now receive personally relevant tuition and financial aid information without even applying to the institution. The results of this study suggest that institutions deploying the Net Price Calculator actively (with high visibility) may have a greater impact on conveying financial aid information than institutions deploying the Net Price Calculator passively (with low visibility).

In the school and community context of the conceptual model, high schools tend to perpetuate differences across income and ethnic groups with respect to access to information about college tuition and financial aid (McDonough & Calderone, 2006; Perna, 2006; Tierney & Venegas, 2009). Resources that promote college enrollment, including academic rigor in the curriculum, exposure to college recruiters, encouragement and counseling, all may tend to go to the high-achieving students, who tend to be from higher-income families (Perna & Titus, 2005). Lower-income students are dependent on high school counselors for information about tuition and financial aid (Cabrera & LaNasa, 2000b), but counseling is limited because of high caseloads (Tierney & Venegas, 2006) and low expectations (Immerwahr, 2003). The Net Price Calculator has implications for the school and community context because it provides an

opportunity and a tool for school personnel to show all students how to get personally relevant information about tuition and financial aid. This study seems to suggest that low-income students may even have an eagerness for acquiring this information in this way.

Finally, Perna (2006) suggests in the conceptual model that habitus, or the lifestyle, cultural values and expectations of social groups, may account for differences in the acquisition and use of information. If their habitus includes assumptions about published tuition prices, or an unwillingness to incur student-debt, the idea of going to college may seem so out of reach that they don't seek available information about financial aid (Perna, 2006). The Net Price Calculator has implications for the habitus context of the conceptual model because it provides personalized information about financial aid and loan eligibility, and clearly establishes the difference between published tuition prices and an individual student's net price. The results of this study showing that low-income students are using the Net Price Calculator suggest that this Internet tool might have an impact in changing the assumptions of habitus with respect to college affordability.

In summary, this study suggests that the Net Price Calculator could have the potential to address many of the constraints identified in the research and in the conceptual model as contributing to the gap across income groups in access to useable information about tuition and financial aid.

Recommendations for Practice

The results of this study show that the Net Price Calculator was nine times more likely to be used when it was located with high visibility on an institution's website. The results also indicate that low-income students used the Net Price Calculator more than middle- and high-

income students, wherever it was located. These findings have potential implications for policy and practice.

The federal government's Net Price Calculator requirement does not specify where on an institution's website this Internet tool must be located, but it does recommend that it be easy to find (Higher Education Opportunity Act, 2008). Although much more research is needed into Net Price Calculator usage at more and different types of higher education institutions, the results of this study suggest that federal policy makers should consider the ramifications of requiring all institutions to locate a direct link to the Net Price Calculator on the home page. The goal of the Net Price Calculator requirement is to make tuition, financial aid and college affordability information more easily available to more people. In this study of six four-year, private, non-profit institutions, almost nine times more people used the Net Price Calculator when it was highly visible on the website. Although not generalizable without further study, the findings suggest the possibility that the Net Price Calculator might get more use if it were located with high visibility across institutions.

Of course, institutions could act on their own initiative, even without a government requirement. Colleges and universities interested in equity and access to information about tuition, financial aid and affordability at their institutions, should consider how they have deployed the Net Price Calculator, who is using it, and whether they can increase its visibility. Even though a google search for "(college name) net price calculator" will almost always bring up a direct link to an institution's Net Price Calculator, as will most college websites' own search engines, this study of actual student usage data suggests that there might be no substitute for prominent website display of the Net Price Calculator.

The findings also have potential implications for high school counselors. The results suggest that low-income students persisted in finding and completing the Net Price Calculator more than middle- and high-income students and present a potential opportunity for high school counselors or teachers to use the Net Price Calculator intentionally as a way to include all students in learning about higher-education tuition, financial aid, and affordability, and to help each student develop appropriate aspirations for higher education attainment.

Topics for Further Research

This study of Net Price Calculator usage data at six four-year, private, non-profit universities during the first full year of the federal requirement suggests an open field for further research. The Net Price Calculator provides personalized, school-specific information about tuition, financial aid and net price. This study suggests it has the potential to help close the information gap identified in research as being one impediment to higher education attainment among low-income students.

Research into use of the Net Price Calculator should include all types of higher education institutions. It should examine who is using the Net Price Calculator, in what numbers, at what high school grade levels, and whether there are differences in these measures across socioeconomic groups.

Research is needed to determine whether students are using the Net Price Calculator early in the college search process, as a way to identify colleges they can afford, even those they might have thought out of reach. Research is needed to determine the extent to which marketing efforts at different institutions increase Internet traffic to the Net Price Calculator, and how that increased traffic is distributed across demographic groups. It may also be worth exploring whether high school counseling practices are changing in response to the opportunities presented

by the Net Price Calculator, and how those changes, if any, are having different impacts across groups.

Other questions for future study include how accurately Net Price Calculators perform across institutions. Do the net price estimates they generate come close to the actual financial aid award letters admitted students receive? How does the relative complexity of Net Price Calculators – that is, the number of questions asked and the degree of detail required – vary across institutions, and how does that variance affect usage levels and the accuracy of the estimates? Does a more complicated Net Price Calculator increase accuracy but reduce usage? If so, what is the optimal balance between precision and usage at different types of institutions?

As more and more students use the Net Price Calculator earlier in the search process – and therefore learn their estimated net cost at the beginning instead of at the end of their college search -- how will colleges and universities need to adjust the timing and content of their enrollment marketing messaging and strategies? Finally, does increased use of the Net Price Calculator correlate with increased enrollment in institutions of higher learning, and how do these outcomes compare across demographic groups?

Limitations of the Study

This study involved a total of 10,726 instances in which a Net Price Calculator operation was completed, and a net price was generated for the user, at a total of six four-year, private, non-profit institutions of higher learning. The data are anonymous. It is not possible to know whether the same user completed the process at the same institution more than once, or experimented with different numbers to get different outcomes. Only six similar private institutions are included in this study, and the results are not generalizable to other sizes and types of colleges and universities without further research. The study is limited to the first year

of the Net Price Calculator requirement. The nature and frequency of use may change over time. The study does not examine a connection between Net Price Calculator use and enrollment in college. The findings should not be generalized to other types of institutions of higher learning, such as public universities, community colleges or for-profit institutions.

These results assume equal volumes of Internet traffic to the different websites of these similar institutions, because there is equal opportunity for all to visit any higher-education institution's website. However, actual overall traffic volumes to the websites themselves are not known. Confounding effects from variables such as differences in institutional marketing initiatives or differences in Net Price Calculator visibility within the high-visibility and low-visibility categories could also impact completion frequencies, and suggest areas for future research. In addition, chi-square test results are subject to inflation when sample sizes are large, so that strong statistical significance is accompanied by low effect size. For practitioners, however, the importance of an effect may depend on costs and benefits. Placing the Net Price Calculator where users can easily find it costs nothing, and even a small effect on usage could represent an important improvement, especially over time.

Summary

Higher education is valuable to individuals and to society. Income-related gaps in higher-education attainment are large and persistent, and they perpetuate poverty. A lack of access to useable information about tuition and financial aid is one of several key impediments for lower-income students' attaining higher education. To improve access to information about tuition and financial aid, the federal government required all institutions of higher learning to post a Net Price Calculator on their websites beginning in 2011. The requirement did not specify where on the website the Net Price Calculator should be located. The purpose of this study was to examine

whether prominent website placement affects the number of students who find and use this new tool to gain information about affordability and access to college, the degree to which prospective college students of differing income levels are finding and using this new tool, and whether website placement impacts different usage frequencies among different income groups. The study found that Net Price Calculators placed with high visibility have almost nine times more users than those placed with low visibility. And the study indicates that low-income students appeared to be more likely to use the Net Price Calculator than their middle- and high-income peers, wherever it was located. The findings suggest the possibility that the Net Price Calculator may have potential to help close the financial aid information gap identified in research as one key impediment to higher education attainment for low-income students. If so, the Net Price Calculator requirement could advance the democratization of higher education by broadening access and equity, thereby extending the distribution of higher education's positive outcomes throughout society.

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